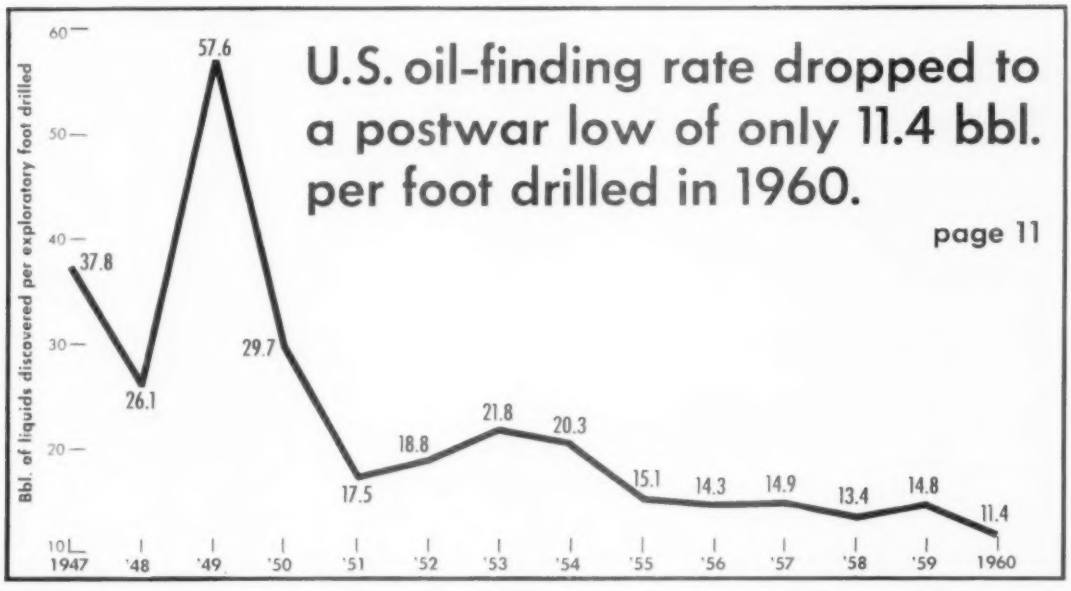
MAR. 24 1961

PETROLEUM WEEK

A McGRAW-HILL PUBLICATION



U.S. oil-finding rate dropped to a postwar low of only 11.4 bbl. per foot drilled in 1960.

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U.S., Russia to swap gas teams next 20

Cost cutting revives California field 29

Is Libya's concession price too high? 44

Commission sales on tires face change . . . 49

Price 50 Cents

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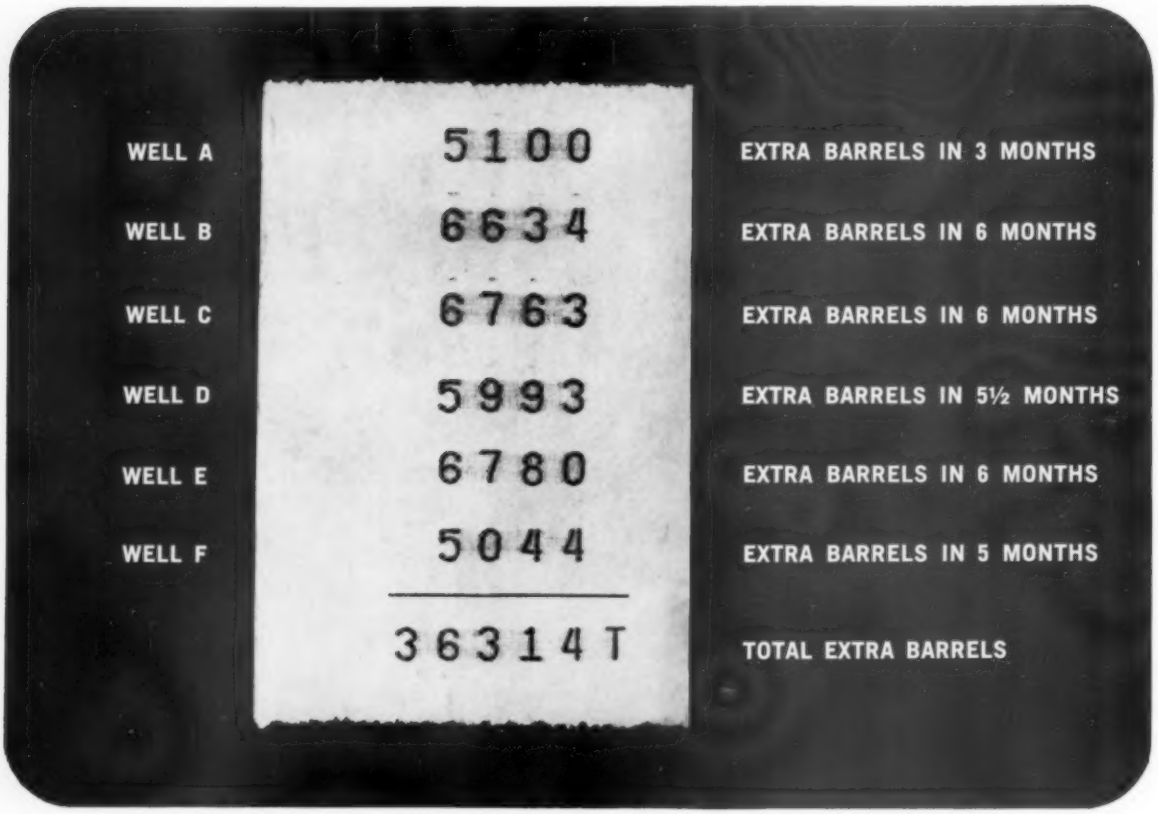
could you use production increases like these?



This operator got 36,314 barrels of extra oil from six wells within six months after they were fractured by Dowell. Total service costs for the six treatments averaged only $2931.79 per well. The extra oil produced during the first six months, as a result of fracturing, cost less than 49 cents per barrel. Additional production after the first six months will be almost clear profit.

All six wells, in Manitoba, Canada, were treated by Dowell at about the same time. All were given similar treatments in which 50,000 pounds of 20-40 mesh sand, at 2-3 pounds per gallon of lease oil, were injected into the pay zone at about 40 bpm. The production gain was determined for each well by comparing total production for equal periods immediately before and after treatment. Production periods were six months for three of the wells. Records for the other three wells covered 5½, 5 and 3 months, both before and after treatment.

Your production problem may be different from the one faced by this operator. The chances are good, however, that Dowell engineers can design a treating program to help you produce more oil at less cost per barrel.

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SERVICES FOR THE OIL INDUSTRY — DOWELL — DIVISION OF THE DOW CHEMICAL COMPANY

A Big Lift for Sinclair Chemicals

The tallest distillation tower ever raised in one piece was lifted to its foundation in Houston, Texas recently. Coming along are five more like it. All will be part of a plant being built by Sinclair-Koppers Chemical Company to make styrene monomer, an ingredient of plastics and synthetic rubber.

In this joint undertaking with Koppers Company, Inc., *the Sinclair organization continues to expand its petrochemical operations.* Sinclair Refining Company will supply the basic raw material for the new plant. This raw material – ethylbenzene – will be made into styrene for use or sale by Koppers.

Sinclair has increased its petrochemical production and sales at a rapid rate in the past five years. It expects to maintain this pace with projects like the styrene plant and others being planned. *Chemical manufacture is the fastest growing part of Sinclair's business.*

The AIChE — Sinclair salutes the American Institute of Chemical Engineers for encouraging the advanced processing techniques which promote industrial progress. Founded in 1908, the institute — through its 20,450 members — advances chemical engineering standards, encourages original research, and fosters engineering education.

Sinclair

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Views That Make News

How Much Canadian Oil?

Dear Sir:

The generalizations and isolated facts cited in your editorial "Canada's Exemption Needs Review" [PW—Feb.10'61,p50] encourages readers to view Canada's oil policy as a threat to U.S. oil production. This is not true. I consider your editorial "slanted," and I suggest many Canadians take exception to it.

In "reviewing" the exemption, you should consider that in 1959 Canada imported $3.7-billion of goods from the U.S., which imported only $3.2-billion from Canada. Including payments for travel, interest and dividends, and services, Canada paid $5.6-billion to the U.S., while the U.S. paid $4.4-billion to Canada—a difference of $1.2-billion. These figures were given to the Economic Club of Chicago by our Minister of Finance, Donald M. Fleming, on Feb. 14.

The U.S. imports 1-million b/d of oil; 11% comes from Canada. We suggest you import more from Canada to the extent of slightly more than 1% of your total consumption—to raise your imports of Canadian oil to the 250,000 b/d you seem concerned about. As a $5-billion customer of yours, we suggest you decrease some of your imports from the Middle East and/or South America to offset this.

As a neighbor and good customer, we do not wish, or think it necessary, that you curtail your production.

D. K. GUNDERSON
Vice-president, general manager
Double-A Drilling Co., Ltd.
Calgary

Tax Diversion Defended

Dear Sir:

One takes it for granted that your views will be slanted to serve the industry you represent.

Just the same, good citizenship requires a broader perspective on the gasoline tax issue.

The railroads, desperate as they are, have never suggested that railroad excise taxes should be used only for railroad purposes.

The heavily taxed cigarette and liquor manufacturers do not expect their payments to be devoted to the welfare of their own industries.

Entertainment and sporting goods levies are not used to support amusements or athletic events.

Only the highway industries have the nerve to ask that they be, in effect, exempted from taxes by having their "taxes" earmarked for their particular benefit.

ROBERT B. SHAW
A. Vere Shaw & Co.
New York

• Petroleum Week doesn't feel that its views are slanted to serve only the oil industry. The gasoline tax is paid by motorists and not by highway industries. We contend that the tax money paid by motorists should be used for highway purposes.

Benzene Stories a Credit

Dear Sir:

I have just had the pleasure of reading the article "Midwest Gets First Facilities to Make Petroleum-Based Benzene [PW—Feb.24'61,p37].

A number of us have discussed this article and all agree that it is an excellent example of reporting, is well written, and a credit to your publication. This is not the kind of article that can be released from a single company, and its composition, therefore, had to be a result of careful investigation and good reporting.

F. C. MORIARTY
Vice-president, manufacturing
Aurora Gasoline Co.

Dear Sir:

On behalf of Houdry Process Corp., I should like to compliment PETROLEUM WEEK on the article on the Detol process, "Benzene From Toluene: Another Way" [PW—Feb.24 '61,p36]. We were impressed with the thoroughness with which you prepared and wrote the article. The story was presented in a highly interesting and accurate style.

J. C. DART
Vice-president, sales and service
Houdry Process Corp.

Cooperation Pledged

Dear Sir:

Congratulations on your editorial "Producers Need the Industry's Support" [PW—Feb.24'61,p56].

I want to pledge the support of the Independent Oil Men's Assn. of New England to the spirit which you subscribe to, and to suggest that the pressures which you refer to may very well be the unifying force which would make it possible to bring together for discussion representatives of every segment of the industry toward finding the areas of true mutuality of interest.

It seems appropriate that the producers are the ones at this time whose livelihoods may be threatened. I am certain that refiners and marketers, down to the smallest independent dealer, are anxious to do whatever is necessary to develop policies that will work toward the greatest good for all segments of the industry. Perhaps learning to work together now will enable us to find some mutuality of interest on imports and a national fuels policy later.

Why not get together a meeting of a very limited number of representatives of each segment—men of good will—to discuss the situation? No one can tell what great good may come of it.

THOMAS J. SCOTT
President
Independent Oil Men's Assn. of New England

One Side of the Coin

Dear Sir:

I am very much pleased with your handling of the subject on furnace oil pricing. I think the editorial "Every Coin Has Two Sides, You Know" [PW—Mar.3'61,p52] is very good and very well done. I think the industry in its efforts to give the new Administration a chance is accepting Secretary Udall's blast with entirely too much complacency.

DWIGHT T. COLLEY
Vice-president,
general manager of marketing
Atlantic Refining Co.

How to Compete

"The way the domestic oil industry will be able to compete with the cheapest foreign oil and operate under a large overhang of Free World potential supply is by further improvements in recovery methods for the production of domestic oil reserves now known to be in place. Improvements in recovery methods will involve expense dollars principally, rather than capital-investment dollars."

—E. O. BUCK
Senior vice-president, executive assistant to the chairman
National Bank of Commerce of Houston

PETROLEUM WEEK *will publish reader comments each week. Address letters to LeRoy Menzing, Editor,* PETROLEUM WEEK, *330 W. 42nd St., New York 36, N. Y.*

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INSIDE *Slant*

FOLLOW THE ADVICE

We hope our industry can match the prudence and good sense of the Texas Railroad Commission over the rest of the year.

This expression from J. E. Dyer, vice-chairman of Sinclair Oil Corp., sums up the sentiment of the top executives who appeared before last week's proration hearing of the Texas regulatory body.

All highly praised the commission for its leadership in the industry.

At the same time, these same executives testified that top management was responsible for refinery operations, which means the excessive runs.

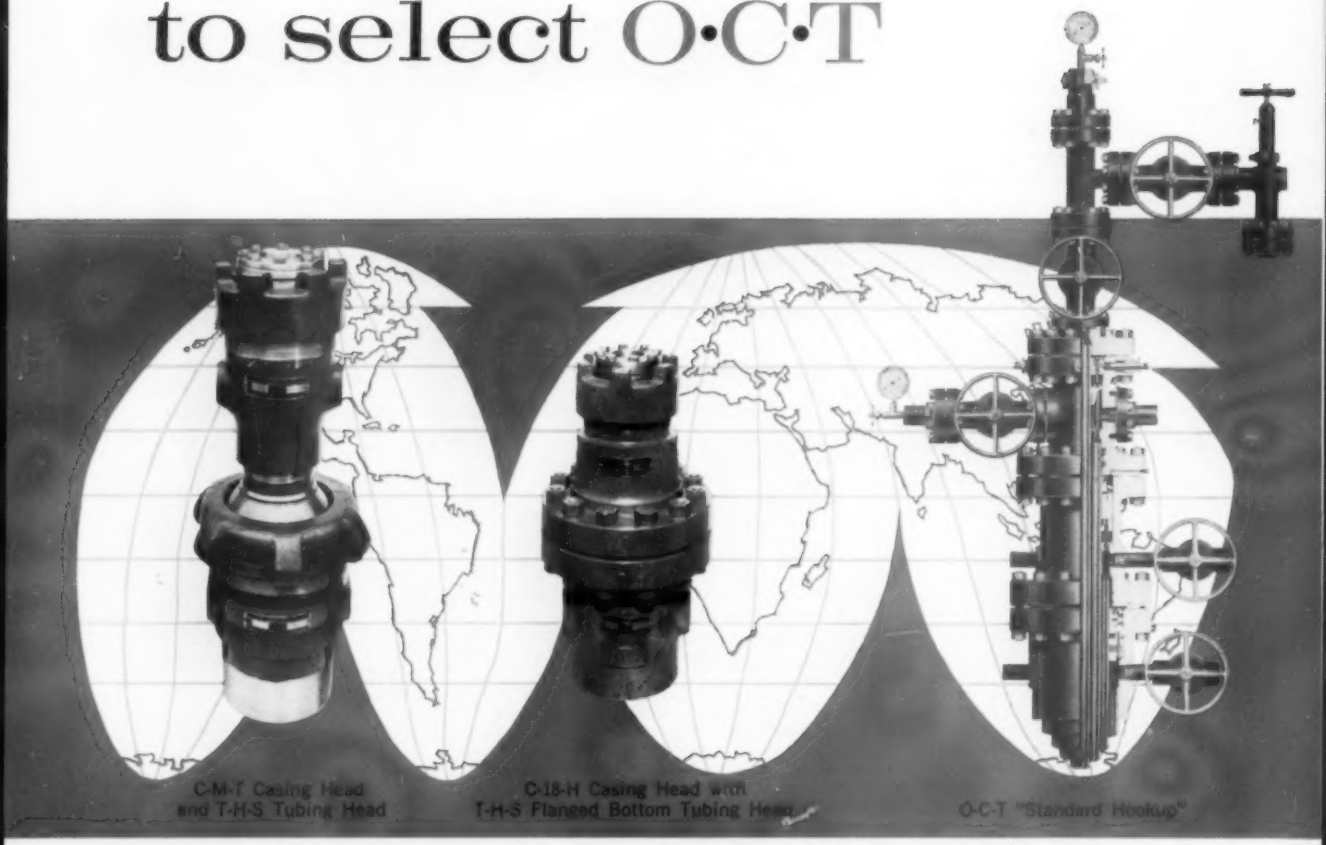
Yet they expressed concern over the high rate of refinery runs, which, through their own admission, is their responsibility.

And they also expressed concern over the results of the excessive refinery operation—too much product in storage.

In view of these statements before the commission, there is no question but that the welfare of the industry rests on how wisely these same executives manage excess capacities in the future.

LeRoy Menzing
EDITOR

The reason to select O·C·T



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60-Second Summary

THE WEEK'S MOST IMPORTANT DEVELOPMENTS

PETROLEUM WEEK

March 24, 1961

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U.S. reserves of gas and liquid hydrocarbons made only slight gains in 1960, reflecting a poor exploratory year. Natural gas reserves advanced 0.4% to 263.7-trillion cu. ft., a new high (page 14). Liquid hydrocarbon reserves also reached a new peak, at 38.4-billion bbl., but the gain was due entirely to larger reserves of gas liquids. Crude reserves declined by 106.1-million bbl. . . . p. 11

•

Exploratory drilling declined in Canada last year, but the success ratio increased bringing a sharp gain in reserves. Liquid hydrocarbons reserves increased 5.4% to 4.2-billion bbl., and gas reserves gained 15.3% to 30.7-trillion cu. ft. . . . p. 15

•

A seasonal tapering off in demand and a contraseasonal decline in gasoline prices are serving to wipe out oil's good start in 1961. The blame can be placed on high refinery runs in late February and early March. . . . p. 16

•

A 50-year-old California oil field has been given a new lease on life. Thanks to Mobil Oil Co.'s restorative measures—turnkey contracts and slim-hole completions—Lost Hills field now has a production of 4,537 b/d. . . . p. 29

•

Another U.S.-Russian inspection team swap is in the works. This one will involve an exchange of natural gas officials with a Russian group scheduled to come here in May. . . . p. 20

•

Chances are good that oil prices are free to move up and down at will if a country's crowded. Conversely, where population is thin, prices are usually severely regulated. . . . p. 37

•

The Federal Trade Commission's ban on overriding commissions to oil companies on tires will require changes in merchandising. The ruling ostensibly was intended to increase competition—a view that's disputed by oil legal experts. . . . p. 49

•

Coring while drilling is now technically feasible, but costs remain a barrier to field use. Details of the continuous-core drilling rig were outlined this week. . . . p. 23

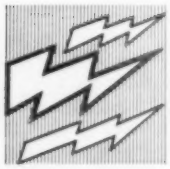
•

Is Libya pricing itself out of the market for oil exploration? That question was amplified last week when the government accepted three new concession applications. . . . p. 44

•

Cities Service Gas Co. will soon start injecting gas into its deepest storage field yet. The Alden (Kan.) field has 12 storage wells, drilled to a depth of 3,318 ft. . . . p. 34

Up to the Minute



SIGNIFICANT LATE NEWS

PETROLEUM WEEK

March 24, 1961

Transmission firms may be forced to acquire substantial reserves of gas to meet their long-term market commitments. Such a change from the normal pattern of contracting for gas supply from producers appears to be developing. It's the result of prolonged delay by the Federal Power Commission in finding a satisfactory method of regulating producer prices as ordered by the Supreme Court, and more specifically of the high court's voiding of an FPC order last year covering sales of offshore gas.

Tennessee Gas Transmission Co. plans to spend $165.6-million for Gulf of Mexico gas reserves of more than 1-trillion cu. ft. The gas, and 22.6-million bbl. of liquid hydrocarbons, would be purchased from the Mobil-Continental-Newmont group in the East Cameron and Vermilion areas off the Louisiana coast, and from the Continental-Atlantic-Cities Service-Tidewater group in Louisiana's Ship Shoal area. Previously, TGT acquired more than 1-trillion cu. ft. of gas reserves from Pan American Petroleum Corp. in Louisiana's Bastian Bay field for $159.4-million.

•

Sun Oil Co. now plans to run well ahead of the industry in its programmed hike in capital expenditures this year. It has scheduled capital spending totaling $94.2-million, up 28.9% over 1960. The largest increase will be in manufacturing facilities, with the budget set at $32.1-million, up three-fold over last year. Production capital outlays, however, will account for nearly half of the total at $42.4-million, a gain of 17.1% over last year.

•

One producer group wants a change in the exempt status of imports from Canada and Mexico and reductions in "historic" crude allocations. The Independent Petroleum Assn. of America proposed to Interior Secretary Stewart L. Udall this week that the preferential treatment given overland imports from the two neighboring countries be changed to a "preferred position in relation to other imports"—not in relation to U.S. production, which, it argued, is now the case. IPAA also said that the gradual reduction in residual fuel import quotas to historical importers should be applied to other imports.

•

Interior officials hope to get a helium conservation program started by July 1. They are starting negotiations for the purchase of helium by the federal government from four companies—Cities Service Helium, Inc., Helium Conservation Corp., Northern Natural Gas Co., and Panhandle Eastern Pipe Line Co.

•

The Independent Petroleum Assn. of America has asked the Federal Power Commission to reconsider its ban on indefinite gas price clauses. The FPC order outlawed all types of indefinite pricing provisions in producer contracts filed after Apr. 3. In its request to FPC, IPAA argued that the commission was in error in issuing the order without public hearings, and that it exceeded its authority, since the order "is in clear conflict with the Natural Gas Act."

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1. Informing customers. Bringing timely information on a wide variety of subjects to customer people who can best use it is an important part of Ed's job. Here, he points out highlights of Ethyl's latest *Annual Review of Gasoline Quality* to an oil company vice president.

Meet Ed Erskine

Ethyl Representative in the Western Region

Streamline a blending system? Aid in promotion of a new gasoline? Plan a "different" dealer training program?

Those are the kinds of problems Ed Erskine gets as a key contact man, serving district or division offices of oil companies on the West Coast.

To provide answers, he can call in Ethyl specialists, or arrange for his customers to utilize Ethyl's varied technical facilities.

As a recent example, Ed and an Ethyl Product Service Engineer made a detailed analysis of a customer's gasoline blending operation. Ed then recommended the use of Ethyl-designed jet nozzles and a revision in operating procedure. Result: a much more uniform blending program with a 3-hour saving in mixing time.

Another refiner cut unloading time of "Ethyl" fluid by over 40% after Ed recommended a fluid flow control unit and full flow valves.

Erskine practically grew up in the oil business—his father was an oil man. After working summers in service stations while getting his Indiana University degree, Ed came to work for Ethyl. That was 11 years ago.

From that point on—except for a hitch as a Marine Corps pilot—Ed toured half the country with Ethyl training presentations for oil company personnel. Then it was Product Service Engineer and other posts, making him well suited for his present responsibility.

His extra-curricular activities include membership on the Southern California Committee of Training, API Division of Refining. Erskine is typical of the men who tailor Ethyl's wide range of services to your needs.

ETHYL CORPORATION

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ETHYL REPRESENTATIVES ARE CHARGED WITH ONE RESPONSIBILITY...

2. Follow Through. Ed and an Ethyl Product Service Engineer recommended several innovations to aid in fast, uniform mixing of antiknock compounds with gasoline at this refinery. Now Erskine is checking on performance during one of his periodic visits.

3. On the Alert. This refinery had been using phenylene diamine (PDA) for inhibitor sweetening and gasoline storage stability. Ed suggested using an experimental mixture of "Ethyl" Antioxidant 733 and PDA. This combination did the job for about half the previous cost.

4. Problem Solving. Whenever an Ethyl specialist can be of service, Erskine makes arrangements to bring him in. Here, he and Automotive Engineer Marv Russell joined the oil company representative in the investigation of an operating problem in marine engines.

5. New Product Data. Erskine and Ethyl Product Manager Bob Carleton combine forces to discuss the widening application of Antioxidant 702 with oil company executives. This unique ashless product for lubricants is proving itself the ideal companion to ashless detergents.

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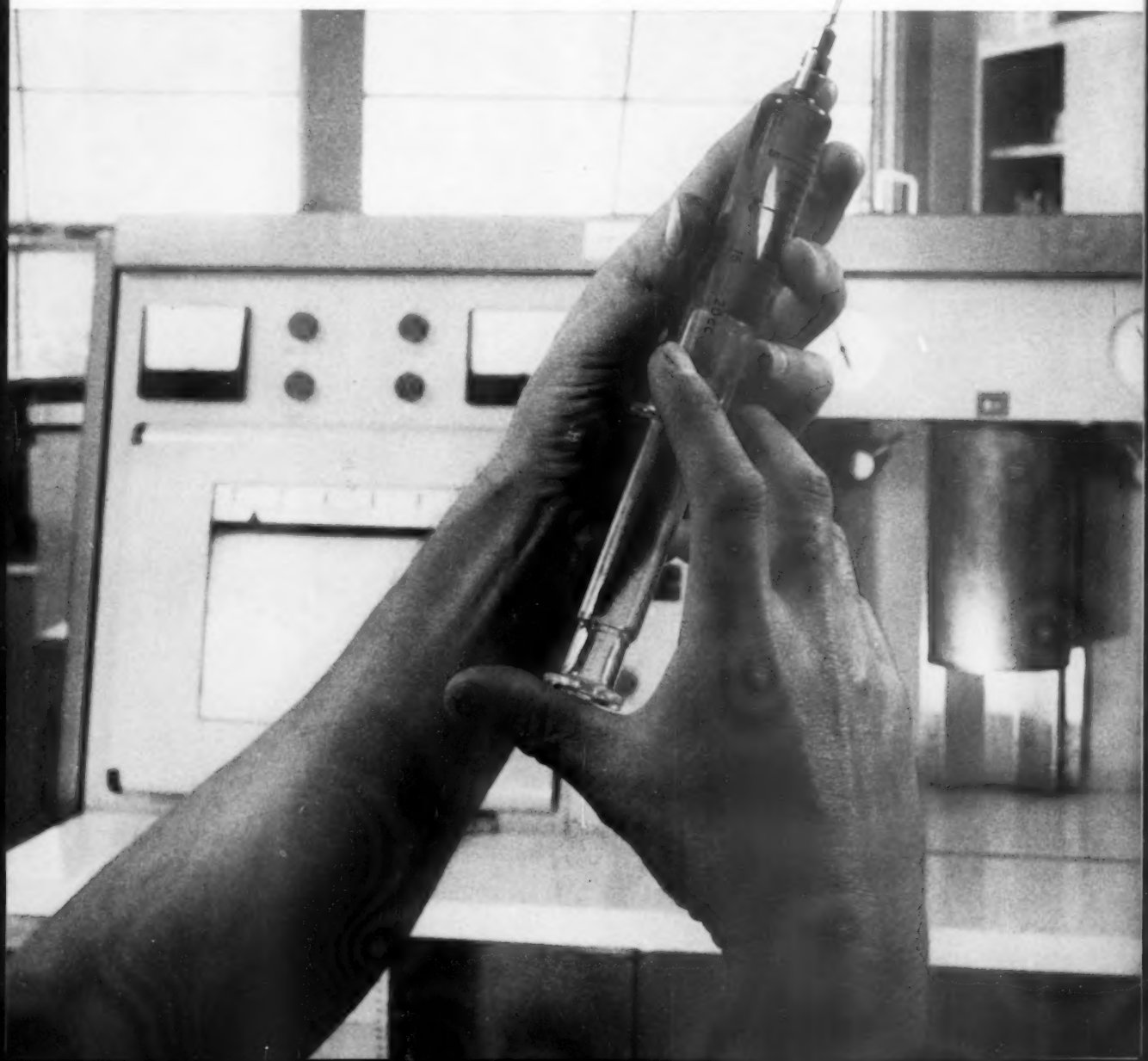


Oil Reserves Up 0.5%; Finding Rate Dropped in 1960

Domestic reserves of liquid hydrocarbons reached 38.4-billion bbl. Gross additions barely exceeded production at 1.06 bbl. to 1. The finding rate—liquids found per foot of exploratory drilling—dropped to a postwar low of 11.4 bbl. The year's supply declined to 13.2.

Year	Total exploratory tests	Success ratio, percent	Strict wildcats drilled for oil	Barrels of liquids found per ft. drilled
1947	6,775	20.34%	3,155	37.8
1948	8,013	18.25	4,041	26.1
1949	9,058	20.20	4,164	57.6
1950	10,306	19.54	4,991	29.7
1951	11,756	18.86	5,861	17.5
1952	12,425	18.78	6,318	18.8
1953	13,313	20.13	6,408	21.8
1954	13,097	20.68	6,777	20.3
1955	14,937	20.78	7,477	15.1
1956	16,173	19.13	8,137	14.3
1957	14,707	19.11	7,464	14.9
1958	13,199	19.46	6,382	13.4
1959	13,191	19.83	6,387	14.8
1960	11,704	18.70	6,707	11.4

U.S. reserves of liquid hydrocarbons increased slightly last year to a new high of 38,429,270,000 bbl. But the net addition of 187,615,000 bbl. was the smallest for any postwar year, except for a decline in reserves in 1957.

The break down in reserves compiled by the Joint Committee on Reserves of the American Petroleum Institute and the American Gas Assn. showed a net decline of 106,136,000 bbl. in crude reserves and a net gain of 293,751,000 bbl. in natural gas liquids reserves.

Crude reserves at the end of 1960 were esimated at 31,613,211,000 bbl. and natural gas liquids reserves were placed at 6,816,059,000 bbl. by the API Committee on Petroleum Reserves headed by Morris Muskat of Gulf Oil Corp.

The combined volume at the end of the year was equal to a 13.2-year supply, based on 1960 production.

Gross additional to liquid hydrocarbon reserves, amounting to 3,090,458,000 bbl., exceeded production in 1960 by a ratio of 1.06 bbl. of reserves to 1 bbl. produced.

That ratio compared to 1.5 bbl. to 1 in 1959 and 1.3 bbl. to 1 in 1958. In 1957 when net liquids reserves declined, the ratio of gross new reserves attributed to that year was 0.88 bbl. to 1 bbl. produced.

The gross crude reserves assigned to 1960 through new discoveries, extensions to known fields, and revisions of earlier estimates amounted to 2,365,328,000, a ratio to production of 0.96 bbl. to 1.

Gross additions to natural gas liquids reserves of 725,130,000 bbl. amounted to a ratio to production of 1.7 bbl. to 1.

A correlation of the reserves statistics with those for exploratory drilling show that 1960 was the worst year for exploration in the postwar period with the indicated oil-finding rate dropping to 11.4 bbl. per foot drilled.

Last year's finding rate for petroleum liquids was 14.8 bbl. per foot drilled (table, above).

The finding rate is computed by dividing the footage drilled in new-field wildcats (after deducting the footage in gas producers) into the liquids reserves attributed to discoveries in new fields and new pools in old fields.

Along with the slight increase in reserves last year, total exploratory drilling in the U.S. declined noticeably—off 11.7% in footage and 11.2% in the number of tests drilled.

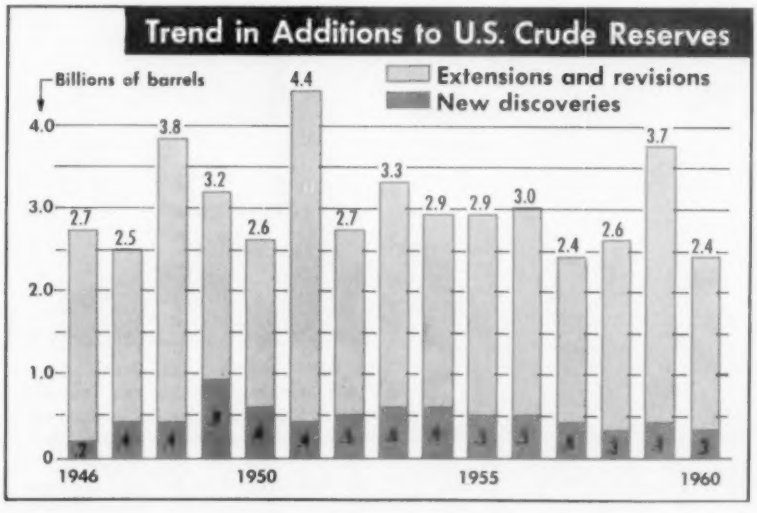
The AAPG committee, headed by J. Ben Carsey, exploration advisor of Humble Oil & Refining Co., reported this week that 11,704 exploratory tests of all classes were drilled in 1960, amounting to 55,830,676 ft.

Of the total tests drilled, 2,189 found some oil or gas representing a success ratio of 18.7%. It was the lowest ratio of success since 1952.

In terms of footage drilled in all exploratory tests, one producer foot was drilled for each 3.54 ft. of dry hole, compared with the 1959 ratio of 1 for 3.33 ft. of dry hole.

The successful tests included 144 multiple completions.

The number of new-field tests—



Estimated Crude Reserves in U.S.

(in thousands of barrels)

	Proved Reserves 12/31/59	Extensions and Revisions 1960	New Discoveries 1960	Production 1960	Net Changes in Reserves 1960	Proved Reserves 12/31/60
Ala.	34,248	6,387	—	7,330	—943	33,305
Ark.	312,911	14,416	820	26,150	—10,914	301,997
Calif.*	3,762,507	189,168	10,916	304,049	—103,965	3,658,542
Colo.	380,952	28,128	1,510	46,731	—17,093	363,859
Ill.	594,407	37,694	1,473	77,648	—38,481	555,926
Ind.	73,751	3,338	947	11,985	—7,700	66,251
Kan.	917,503	68,198	11,165	113,017	—33,654	883,849
Ky.	136,324	14,146	122	21,685	—7,417	128,907
La.*	4,660,088	417,301	54,275	346,284	125,292	4,785,380
Mich.	55,335	37,752	625	15,890	22,487	77,822
Miss.	389,337	64,643	3,238	50,120	17,761	407,098
Mont.	309,268	—16,890	4,590	30,281	—42,581	266,687
Neb.	80,558	20,828	8,335	23,547	5,616	86,174
N. M.	1,025,789	142,951	19,187	104,269	57,869	1,083,658
N. Y.	34,197	—	—	1,814	—1,814	32,383
N. D.	381,909	63,962	6,580	21,930	48,612	430,521
Ohio	74,137	5,590	—	5,050	540	74,677
Okla.	1,864,749	106,157	9,248	189,654	—74,249	1,790,500
Pa.	113,574	—	—	5,942	—5,942	107,632
Texas*	14,859,674	703,918	90,959	896,059	—101,182	14,758,492
Utah	194,539	50,068	1,332	37,475	13,925	208,464
W. Va.	51,259	2,449	—	2,275	174	51,433
Wyo.	1,402,938	146,690	8,519	130,772	24,437	1,427,375
Misc.	9,193	4,578	20,015	1,507	23,086	32,279
Total U.S.	31,719,347	2,111,472	253,856	2,471,464	—106,136	31,613,211

*Includes offshore reserves

Liquid Hydrocarbon Reserves in U.S.

(in thousands of barrels)

	Proved Reserves 12/31/59	Extensions and Revisions 1960	New Discoveries 1960	Production 1960	Net Changes in Reserves 1960	Proved Reserves 12/31/60
Ala.	34,248	6,387	—	7,330	—943	33,305
Ark.	344,928	11,776	835	28,045	—15,434	329,494
Calif.*	4,087,825	205,775	11,281	332,478	—115,422	3,972,403
Colo.	405,866	30,827	1,870	50,680	—17,983	387,883
Ill.	605,161	38,544	1,500	79,226	—39,182	565,979
Ind.	74,075	3,343	948	12,005	—7,714	66,361
Kan.	1,114,415	75,878	12,095	120,136	—32,163	1,082,252
Ky.	185,614	16,146	1,122	24,923	—7,655	177,959
La.*	6,017,886	530,303	98,741	428,575	200,469	6,218,355
Mich.	56,897	37,870	781	16,107	22,544	79,441
Miss.	430,281	60,045	5,578	52,625	12,998	443,279
Mont.	322,779	—19,187	5,691	30,908	—44,404	278,375
Neb.	85,990	22,278	8,360	24,299	6,339	92,329
N. M.	1,448,829	229,085	23,159	132,616	119,628	1,568,457
N. Y.	34,197	—	—	1,814	—1,814	32,383
N. D.	479,387	58,896	6,580	23,574	41,902	521,739
Ohio	75,441	4,286	—	5,050	—764	74,677
Okla.	2,232,318	100,783	13,849	218,137	—103,505	2,128,813
Pa.	117,251	—1,500	—	6,009	—7,509	109,742
Texas*	18,290,049	1,039,321	149,496	1,124,200	64,617	18,354,666
Utah	226,916	70,438	1,332	39,519	32,251	259,166
W. Va.	85,425	13,277	3,610	6,145	10,742	96,167
Wyo.	1,476,217	175,942	8,522	136,931	47,533	1,523,750
Misc.	9,211	4,580	20,015	1,511	23,084	32,295
Total U.S.	38,241,655	2,715,093	375,365	2,902,843	187,615	38,429,270

*Includes offshore reserves

rank wildcats—increased 4.1% last year, the one possible bright spot in the dreary exploration picture.

The rank wildcats totaled 7,320 for 35,899,352 ft.

Those tests amounted to 64.3% of all exploratory footage, compared with 56.15% in 1959.

Of the rank wildcats, 745 found some oil or gas—a success ratio of 10.18%.

That was down from the 10.97% ratio of 1959 and below the postwar average of 11.08%.

No major field—one with ultimate reserves of 50-million bbl. or more—was discovered last year. The last year of such a major discovery was 1954 with two class "A" fields.

The highest ranking oil discoveries in terms of size made in 1960 were three in the class "C" category whose ultimate reserves are now estimated in the range of from 10-million bbl. to 25-million bbl.

That compares to three "B" discoveries (ultimate reserves of between 25-million bbl. and 50-million bbl.) made in 1959, and two class "B" fields found in 1958.

In an analysis of the exploratory statistics of fields having a minimum of six years of development history, the AAPG committee's tabulations show that an average of only one new-field wildcat out of every 45 drilled discovers a field with 1-million bbl. or more of estimated ultimate reserves. In terms of profitable discoveries analyzed over an 11-year period to 1954, only 2% of all new wildcat wells have proved profitable, the committee found.

In terms of over-all gross reserves

J. BEN CARSEY, who served as chairman of the AAPG Committee on Statistics of Exploratory Drilling, is exploration advisor for Humble Oil & Refining Co. He will relinquish the committee post in April to become AAPG vice-president.

found last year, there was some improvement in the percentage of new-field reserves to the total additions.

The reserves discovered in new fields or pools amounted to 12.1% of the gross volume added, slightly higher than in 1959 and back up to the 1958 ratio.

Compared with 1959, the additions attributed to new discoveries declined 21.6% while the total additions (including extensions and revisions) dropped 29.3%.

Of the more significant producing states, 13 showed a decline in liquid hydrocarbon reserves last year, compared with 12 declines in 1959.

California, which has had a long history of decline in reserves, had the largest volume drop of any state last year—a decrease of 115,422,000 bbl in total hydrocarbon reserves.

Oklahoma was close on California's heels with a drop of 103,505,000 bbl.

Other states with declines in liquid hydrocarbon reserves were Alabama, Arkansas, Colorado, Illinois, Indiana, Kansas, Kentucky, Montana, New York, Ohio, and Pennsylvania.

Louisiana again led all other states in the largest volume of additions to its liquids reserves, but its 200-million-bbl. increase in 1960 was less than one-third of the 1959 gain.

Louisiana's total liquids reserves at the end of the year amounted to 6,218,355,000 bbl., 16.2% of the U.S. total. Its 1959 reserves were equal to 15.7% of the nation's total.

Louisiana's production in 1960 amounted to 14.8% of the total.

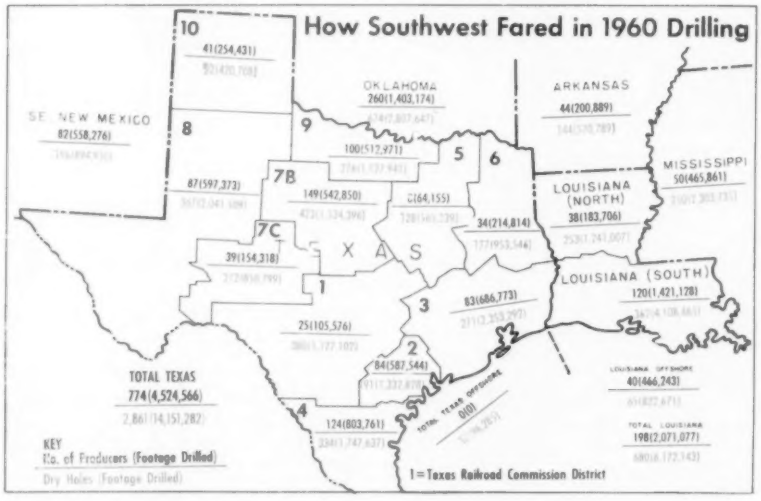
In the volume of additions, New Mexico was in second place with a net gain of 119,628,000 bbl. to push the state's total to 1,568,457,000 bbl. That's equal to 4.1% of the domestic reserves.

Texas, with a very slight increase in total hydrocarbon reserves, held its position of 47.8% of the total, but the largest oil state lost further ground as a producer—declining to 38.7% of the U.S. total, a full percentage point below 1959.

Utah's reserves had one of the most significant gains in 1960—up 14.2% to 259-million bbl.

The state now has 0.7% of the nation's liquid hydrocarbon reserves, and it produces 1.4% of the total.

North Dakota had an 8.8% increase in reserves, boosting its total to 521,739,000 bbl., or 1.4% of the U.S. total. Its production of 23.6-million bbl. last year, was equal to 0.8% of the nation's output.



Estimated U.S. Natural Gas Reserves

(Millions of cu. ft.—14.65 psi. at 60F)

	Proved Reserves 12/31/59 (b)	Extensions and Revisions (b) 1960	New Discoveries (b) 1960	Net Change in Underground Storage (c) 1960	Net Production (d) 1960	Proved Reserves 12/31/60
Alaska	57,975	36,993	13,000	—	305	107,663
Ark.	1,422,817	83,115	36,360	211	82,793	1,459,710
Calif. (e)	8,593,447	395,351	324,694	30,875	500,472	8,843,895
Colo.	2,496,159	—474,828	121,520	565	100,662	2,042,754
Ill.	175,110	8,900	297	7,461	18,633	173,135
Ind.	35,088	1,001	284	1,692	3,945	34,120
Kan.	19,981,403	128,848	156,452	8,366	666,345	19,608,724
Ky.	1,159,381	46,048	9,020	1,918	72,518	1,143,849
La. (e)	59,853,920	4,333,983	2,254,600	—	3,056,362	63,386,141
Mich.	515,403	7,549	31,200	56,057	24,451	585,758
Miss.	2,486,524	31,804	210,390	—581	186,307	2,541,830
Mont.	665,491	—17,245	—	14,126	36,194	626,178
Neb.	132,719	—3,057	861	—	12,695	117,828
N.M.	17,912,798	—1,654,454	127,457	—3,317	778,760	15,603,724
N.Y.	106,519	—7,588	420	1,662	4,812	96,201
N.D.	1,206,542	—35,415	—	—	20,106	1,151,021
Ohio	748,766	34,297	9,250	12,549	39,309	765,553
Okla.	16,651,292	975,342	665,460	1,084	993,975	17,299,203
Pa.	1,051,972	191,836	18,000	27,448	119,671	1,169,585
Texas (e)	120,475,783	2,471,209	2,428,403	7,309	5,902,789	119,479,915
Utah	1,264,250	260,445	63,734	—	62,289	1,526,140
Va.	38,632	—3,330	300	—	2,342	33,290
W.Va.	1,593,551	318,967	71,488	37,001	189,882	1,831,125
Wyo.	3,847,064	199,836	93,719	1,148	207,018	3,934,749
Misc. (a)	123,987	3,203	100	20,654	7,815	140,129
Total U.S.	262,596,593	7,332,840	6,637,809	226,228	13,090,450	263,702,220

(a) Includes Alabama, Arizona, Florida, Iowa, Maryland, and Missouri.
(b) Excludes gas loss due to natural gas liquids recovery.
(c) The net difference between gas stored in and gas withdrawn from underground storage reservoirs, inclusive of adjustments and native gas transferred from other reserve categories.
(d) Net production equals gross withdrawals less gas injected into producing reservoirs. Changes in underground storage and gas loss due to natural gas liquids recovery are excluded. Fourth quarter production estimated in some instances.
(e) Includes offshore reserves.

1960: Good—and Not-So-Good For Gas; Reserves Gain only 0.4%

Domestic reserves of natural gas continued their upward climb in 1960—but the margin over 1959 was a skimpy 0.4%.

The statistics compiled by the Committee on Reserves of the American Gas Assn. were, in fact, almost—but not quite—as depressed as those figures of U.S. liquid hydrocarbon reserves.

The 0.4% increase was the second smallest in the 15 years that records have been kept by AGA.

Proved reserves of natural gas were 263.7-trillion cu. ft. on Dec. 31—an all-time record, but still nothing to get excited about.

The increase over 1959 amounted to 1.1-trillion cu. ft. In previous years, excepting 1954, annual increases ranged from 5-trillion cu. ft. to as high as 14-trillion cu. ft., the latter in 1956.

The 1954 low was a scant 263.6-billion cu. ft., a one-year increase of just 0.1%.

New discoveries during 1960 were about par for the course, but gross additions to reserves, through extensions and revisions of previous estimates, were down considerably.

Discoveries amounted to 6.6-trillion cu. ft., up slightly from 1959. Extensions and revisions, however, amounted to only 7.3-trillion cu. ft., whereas these, for the preceding five years, had been running from 11-trillion cu. ft. to 19-trillion cu. ft.

Gross additions in 1960 were 13.9-trillion cu. ft., far below 1959's total of 20.7-trillion cu. ft.

Production of natural gas surged to new highs too in 1960.

Net production topped 13-trillion cu. ft., for the first time, and represented an increase of 650-billion cu. ft. over the previous peak in 1959.

This, however, merely aggravated an industry problem by constricting the ratio of reserves to net production even more.

On a statistical basis, the supply position at the end of 1960 was 20.1 years. At the end of 1959, the figure was 21.1 years, and for the year prior to that, 22.1 years.

The average during the postwar years was 23.4 years.

This means then that the industry will have to step up its drilling and discovery rate, or face the prospects of an eroding margin of reserves that'll be too thin for comfort in future years.

Where individual states are concerned, New Mexico had another bad year—the second in a row.

A downward adjustment of its reserves as a result of a revision of previous estimates cost it 1.6-trillion cu. ft. In 1959, a similar revision reduced its total by 2.7-trillion cu. ft., making a two-year reassessment loss of 4.3-trillion cu. ft.

Thus, New Mexico's proved reserves of natural gas dropped from 21.1-trillion cu. ft. in 1958, to 17.9-trillion cu. ft. in 1959, and to 15.6-trillion cu. ft. at the end of 1960.

Other states, including Texas and Kansas, had minus signs too in their annual reserves.

Texas' proved reserves dropped from 120.4-trillion cu. ft. to 119.4-trillion cu. ft. Kansas' declined from 19.9-trillion cu. ft. to 19.6-trillion cu. ft. But even with its temporary setback, Texas still holds the No. 1 position in the nation with 45.3% of the U.S. gas reserves.

Other states in the minus column in 1960 included Colorado, Illinois, Indiana, Kentucky, Montana, Nebraska, New York, North Dakota, and Virginia.

On the other hand, Louisiana bettered its position materially with another 3.5-trillion cu. ft. increase.

Louisiana's reserves stood at 63.3-trillion cu. ft. on Dec. 31. The 3.5-trillion-cu.-ft. increase came on top of a 4.7-trillion-cu.-ft. increase in 1958, for a two year total of 8.2-trillion cu. ft. Louisiana's total now represents 24% of the nation's proved reserves.

Louisiana and Texas both had record-breaking production levels in 1960, collectively accounting for two-thirds of the U.S. total output.

And Alaska, for the first time, was listed in the state totals. Heretofore, Alaska's figure had been included in the miscellaneous total.

Chairman of the AGA's reserves committee is Ed Parkes, of United Gas Corp.

Canadian Oil and Gas Reserves Rise

Exploratory drilling in Canada fell off sharply last year but the success ratio went up again, and so did proved reserves of liquid hydrocarbons and natural gas.

These are the highlights of the annual studies released this week by the Committee on Statistics on Exploratory Drilling of the American Assn. of Petroleum Geologists, and the Canadian Petroleum Assn.

There were only 920 exploratory tests drilled in Canada in 1960, compared with 1,036 in 1959, and 968 in 1958.

In Western Canada, 818 holes were completed last year, with a total footage of 4,382,076 ft. Producers included 102 oil and 147 gas.

Eastern Canada had 102 exploratory tests, of which only 13 were successful—two oil wells and 11 gas wells. Footage ran 205,383 ft.

But while the over-all drilling statistics slumped, the percentage of hits improved materially, particularly in Western Canada.

The AAPG study showed that 30.4% of the Western Canada tests were successful. This compares with 27.6% in 1959, and 22% in 1958.

In Eastern Canada, the success ratio was only 12.7% last year.

For the country as a whole, the percentage ratio rose from 27.6% in 1959 to 28.4% in 1960.

Proved reserves continued their upward climb to new all-time peaks.

Crude reserves were increased by 181-million bbl. to 3.7-billion bbl. and natural gas liquids went up 36-million bbl. to 538-million bbl.

This boosted the total of liquid hydrocarbon reserves to 4.2-billion bbl., an increase of 218-million bbl.

Natural gas reserves jumped 4-trillion cu. ft., from 26.6-trillion cu. ft. to 30.6-trillion cu. ft.

And the ratio between net additions to reserves and production in 1960 tightened even further.

Last year, the ratio was slightly more than one barrel of net additions to reserves for each barrel of production.

In bygone years, this ratio ran as high as three and four to one. It has been declining steadily, and in 1959, the gap narrowed to roughly two-to-one.

Unless this trend is arrested, it could mean that Canada is only a year or so away from the day when net additions might dwindle to the vanishing point.

Canada's Crude and Gas Liquids Reserves

(in thousands of barrels)

Crude	Proved Reserves 12/31/59	Extensions and Revisions 1960	New Discoveries 1960	Production 1960	Net Changes 1960	Proved Reserves 12/31/60
N'west Terrs.	51,970	—	—	472	—472	51,498
Brit. Colum.	19,401	24,529	1,895	869	25,555	44,956
Alberta	2,898,878	268,807	15,394	131,887	152,314	3,051,192
Saskatchewan	495,787	53,643	4,755	52,107	6,291	502,078
Manitoba	23,054	2,446	—	4,750	—2,304	20,750
Eastern Can.	8,034	1,053	—	1,019	34	8,068
Total Crude	3,497,124	350,478	22,044	191,104	181,418	3,678,542
Natural Gas Liquids						
Brit. Colum.	23,297	9,160	1,502	977	9,685	32,982
Saskatchewan	14,925	6,410	—	862	5,548	20,473
Alberta	463,923	18,479	9,379	6,715	21,143	485,066
Total Natural Gas Liquids	502,145	34,049	10,881	8,554	36,376	538,521
Total Liquid Hydrocarbons	3,999,269	384,527	32,925	199,658	217,794	4,217,063

Canadian Reserves of Natural Gas

(millions of cu. ft.—14.65 psi. at 60F)

Proved Reserves 12/31/59	Extensions and Revisions 1960	New Discoveries 1960	Net Change in Underground Storage	Net Production 1960	Proved Reserves 12/31/60
26,605,336	4,312,815	290,058	5,435	539,592	30,674,052

Product Price Declines Threaten to Wipe Out the Industry's '61 Gains

The industry's good start for the first quarter appears now to be rapidly vanishing, as indicated by this week's break in product prices.

The most significant break occurred in gasoline prices at the Gulf Coast, a decline that some observers said was long overdue after several months of an "easy position" for gasoline demand.

Prices in the spot cargo market declined 0.5¢ a gal. for all grades of motor fuel. The break lowered the current quote for 98-octane premium to 11.75¢ a gal., and the price of 92-octane regular to 10.75¢ a gal.

The new prices are the same as a year ago—and two years ago.

And just prior to the drop in motor fuel prices, the Gulf Coast spot cargo prices of distillates declined by 0.25¢ to 0.375¢ a gal., more or less heralding the end of the heating season.

This week's decline in gasoline prices may not be the only one this spring.

Trade sources say gasoline can be found at the new lows at several sources of supply. And there are indications that some suppliers are willing to discount even the reduced prices—especially in the higher-octane grades of motor fuel.

The decline in product prices will cut sharply into refiners' margins, which had averaged $1 a bbl. or better in both January and February after a long period of low margins in 1960.

One source estimates that the reductions in product prices so far in March will mean a reduction of around 15¢ a bbl. for refiners on the Gulf Coast. Any further decline in product prices would cut deeper into refiners' margins.

Last year, gasoline prices remained steady through the winter, the spring, and most of the summer, with a belated 0.5¢-a-gal. increase in July, almost at the end of the heavy gasoline demand period.

The price decline reflects to some observers a deteriorating position in the industry's over-all supply-demand balance, which has been developing for the past four weeks.

Demand in January and most of February was strong—the result of the unusually cold winter weather over most of the nation.

But just as total demand began to taper off in mid-February—not an unusual seasonal trend—refinery runs started to mount, reaching an all-time 8,474,000 in the Mar. 3 week.

Runs have declined since, and the announced cutbacks by several large companies indicate that runs will be kept at 8-million b/d or lower for the next six weeks.

Demand for the first ten weeks of the year ran just even with the like period of 1960, which would indicate that first-quarter demand will not exceed last year's.

The reason is that demand in March of last year was unusually strong due to a late winter siege. It was the best month of the 1960 first quarter, with total demand averaging 11,121,000 b/d—second only to last December for the year.

Indications now point to no big upsurge in the remaining days of March to boost this month's rate of demand to anywhere near the year-ago level.

The tighter producing schedule set for Texas wells next month may help bring swelling products stocks back into line.

Last week the Texas Railroad Commission ordered production in April to be held to a nine-day schedule, versus the ten-day permissible for March.

The initial statewide allowable will average 2,882,021 b/d, a drop of 126,098 b/d from mid-March.

New Mexico's schedule remains unchanged, with April unit allowables held by the Oil Conservation Commission at 70 b/d for the northwest and 35 b/d for the southwest.

Texas crude buyers reported that their product stocks on Mar. 1 were some 11.4-million bbl. above so-called "desired" levels, with most of the overage in distillate.

The 29 companies reporting to the commission said that their gasoline surplus amounted to 4.8-million bbl.; kerosine, 1.5-million bbl.; and distillate, 6.5-million bbl. Residual stocks were 1.3-million bbl. below desired levels.

Dispatchable crude held by the companies on Mar. 1 totaled 88.1-million bbl.—less than half of their total crude inventories of 181.8-million bbl.

All told, 583,804 b/d of crude were shipped into Texas from other states last month.

February refinery runs reported to the Railroad Commission were up 552,761 b/d with five companies accounting for 20% of the increase:

	(barrels daily)		
	December	January	February
American Petrofina	17,477	22,949	.....
Ashland Oil	.....	.....	138,527
Atlantic Refining	190,558	200,625	209,549
Bell Oil & Gas	6,447	6,590	.....
Cities Service	238,756	263,462	262,153
Continental Oil	185,398	181,527	196,306
Cosden Petroleum	36,519	36,665	36,486
Crown Central	33,408	35,685	34,998
El Paso Natural	18,305	.....	18,357
Gulf Oil	454,000	471,000	467,540
Humble Oil & Refining	761,000	845,600	875,000
Indiana Oil Purchasing	635,000	693,000	698,827
LaGloria Oil & Gas	17,172	16,957	.....
Ohio Oil	100,718	100,699	.....
Phillips Petroleum	214,400	216,900	221,800
Plymouth Oil	27,105	29,979	35,069
Premier Oil Refining	14,319	12,015	13,496
Pure Oil	165,582	166,319	165,510
Shamrock Oil & Gas	24,331	23,481	19,456
Shell Oil	525,093	524,040	533,433
Signal Oil & Gas	50,701	47,530	65,696
Sinclair Crude Oil	425,296	433,469	430,691
Skelly Oil	51,965	53,254	.....
Socony Mobil Oil	565,000	611,000	594,000
Sohio Petroleum	138,984	124,548	144,285
Standard of California	.....	.....	520,846
Standard of Texas	45,474	50,532	51,353
Sun Oil	220,017	204,292	201,921
Suntide Refining	40,987	44,470	44,233
Texaco	594,884	652,204	678,986
Tidewater	208,613	251,450	251,000
Other	31,933	36,515	.....
Total	6,021,137	6,356,757	6,909,518

PETROLEUM COMMENTS

By Wanda M. Jablonski

Who's Kidding Whom?

The Venezuelan Government has protested to the Kennedy Administration one aspect of the crude oil import program that could well warrant a "new look" under the "New Frontier."

Look, for instance, at what happened in the second half of 1960:

- A total of 151 refiners received crude import quotas.
- Of these, 115 traded off their entire quotas.
- Another 20 traded off almost all their quotas.
- The remaining 16 companies ended up with almost all the crude imported during the period.

In other words, 76% of all refiners assigned quotas didn't use a single barrel of them. Some 90% of all refiners either didn't use, or used only a small fraction of, their quotas.

* * * *

The real point behind these statistics is that the 10% of the refiners who were importers in the true sense had to "buy back" the quotas from the ones who weren't.

These were the companies which were importers all along before the imposition of import controls in 1959; which built coastal refineries for that purpose; and many of which invested in overseas production.

But when mandatory curbs were established, the government decided to take the total import quota and divide it among all U.S. refiners, regardless of whether they could use them.

In effect, it took part of the imports away from the importing refiners, and left it to the importers to "buy back" these rights.

Technically, the government cleared itself by specifying that no one could "sell" his quota. But it has permitted refiners to get around this by a system of "exchange" deals amounting to exactly the same thing: Anyone with a quota can readily trade it off for domestic crude at a profit ranging around $1 per barrel or more.

This may be "legal," but who's kidding whom? It's nothing but government-sponsored subsidy of inland refiners by importing refiners.

And this is no peanut-sized traffic. Some 40% of the total volume of crude imported is involved in such "trades."

The traffic in quotas has become so lucrative, in fact, that some Gulf Coast refiners who in the past imported crude now find it more profitable to "trade off" their quotas to East Coast refiners instead.

The reason the Venezuelan Government is incensed, of course, is because of the depressing effect this has on Venezuelan crude prices and profits. Before this quota system was imposed, American companies with Venezuelan production were at least able to bring their Venezuelan crude to their own East Coast refineries at the full billing price. Now they have to "trade back" a large part of their former import position from inland refiners by discounting their foreign crude.

* * * *

It should be pretty evident by now that there is something very screwy about this aspect of the import program.

There is nothing wrong with the principle of entitling every refinery in the country, small or large, to a quota if he can use one. This avoids the pitfall of gearing imports to historical positions alone, which would freeze the competitive situation.

But if a refiner cannot use his quota in his own plant, then it should be returned for redistribution—not sale—to those who can.

THE RACE BELONGS TO THE SWIFT

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California Studies Joint Gas Hearing

Briefs have been filed, and it's now up to the California Public Utilities Commission to decide whether one big battle or two lesser ones is preferable in the West Coast free-for-all over natural gas supplies.

A motion to consolidate the trans-Mexico pipeline and the Rock Springs pipeline proceedings was proposed by J. Thompson Phelps, PUC counsel as a means of simplifying—to a degree—a fight that's already badly complicated.

Examiner W. W. Dunlop took the matter under advisement earlier this week.

Consolidation of the hearings, as recommended by the PUC staff, will bring all of the principals and opponents into one arena for a knockdown battle over where Southern California should get needed additional gas supplies.

Crux of the dispute is the plan of California Gas Transmission Co., a subsidiary of Tennessee Gas Transmission Co., to haul South Texas and Mexican gas to Los Angeles, via a 1,400-mi., $225-million pipeline.

Southern California Edison Co. wants the gas to assure itself of a firm supply to meet future needs.

Opposing the project are Pacific Lighting Gas Supply Co., and its two subsidiaries, Southern Counties Gas Co. and Southern California Gas Co., which have been supplying Southern California Edison's needs on an interruptible basis.

These firms contend that Edison's plan would disrupt the local market by changing their peak load and offseason distribution picture.

The Rock Springs project, which also is pending before the commission, envisages a tie-up between El Paso Natural Gas Co.'s pipeline with that of Colorado Interstate Gas Co. to deliver an additional 470-million cf/d to the two gas companies at the California-Nevada border. This project is awaiting a final decision from the Federal Power Commission.

Behind the Southern California Edison plan, in addition to Tennessee Gas, are Pemex, Mexico's oil monopoly, and Humble Oil & Refining Co. Humble would be the principal supplier, and additional gas would be picked up in Mexico as the proposed pipeline wends its way south of the border to California.

Current hearings, which resumed last week, could drag on for months.

One of the witnesses last week was Fred A. Hough, chief gas engineer of Bechtel Corp., who expressed doubt that the trans-Mexico pipeline plan would have much effect on the Los Angeles-based gas companies.

Hough told the PUC that, despite the dire predictions of the Rock Springs supporters, the trans-Mexico line, coupled with a modification of the Rock Springs project, would reduce revenue requirements of the gas companies by $31.2-million for the period 1963 through 1967.

He said that even if the Rock Springs and trans-Mexico pipelines were approved as now proposed, there would be no adverse effects on the gas companies' revenue requirements in a normal year—with the exception of a total additional requirement of $700,000 for the years of 1965 and 1966.

On the other hand, the Los Angeles County Federation of Labor (AFL-CIO) formally protested the trans-Mexico line as not being "in the public interest."

This testimony came from Edward T. Shedlock, vice president of the labor group, who termed the plan discriminatory because gas supplies would be made available only to "a few large consumers."

Shedlock also contended that the proposed line would "siphon off job opportunities essential to our economy," and that expenditure of millions of dollars outside the U.S. would be a "definite threat" to unemployed U.S. workers in the construction trades.

Some fingers already have been burnt in the bitter controversy.

The Los Angeles County Board of Supervisors, for example, endorsed the trans-Mexico project as an adjunct to its smog-control program.

Although the resolution has not been withdrawn, at least one harried supervisor called for neutrality on the issue in short order.

The California manufacturers Assn. announced its opposition to the imported gas, but within 24 hours it, too, had retreated to a neutral position.

So acrimonious was the battle in the preliminary stages that the PUC felt it necessary to order a halt in the propaganda and the epithets.

British Petroleum Set to Enter California as an Oil Producer

British Petroleum Co., Ltd., moved last week to strengthen its interest in Canada and Trinidad, and to make its entry as a producer in California.

The company signed an agreement to acquire the interest of Rio Tinto Co., Ltd., in the Canadian and Trinidad properties and certain U.S. holdings of Kern Oil Co., Ltd. Kern is a wholly owned subsidiary of Rio Tinto.

BP will acquire full ownership of Kern Trinidad Oilfields, Ltd., Kern Oil California, Ltd., and St. Helens Petroleum Corp., and Kern's part-interest in Devon-Palmer Oils, Ltd., whose properties are in Canada.

Kern Oil California produces in California and holds leases in Louisiana. St. Helens Petroleum holds leases in Colorado, Wyoming, Montana, and Utah.

British Petroleum will exchange 3-million of its ordinary shares, worth more than $24.8-million at current market prices, for its Western Hemisphere acquisitions.

Rio Tinto acquired Kern Oil Co. in 1957 on a cash and share-exchange basis.

Kern Oil will retain an interest in the undeveloped exploration properties of its American subsidiaries, and in certain circumstances will be entitled to payment from further reserves that may be proved on its Wyoming properties within the next three years.

BP is already established in Canada through Triad Oil Co. and BP Canada, and in Trinidad through Trinidad Petroleum Development Co. and Apex (Trinidad) Oilfields, which it acquired last October.

editorial index

The index to the editorial contents of Petroleum Week, covering the issues published from July through December, 1960, is now ready for distribution. Single copies are available to subscribers without charge. Readers who have previously asked to be placed on the permanent mailing list will receive the index automatically. Others may address requests to Editor, Petroleum Week, 330 West 42nd Street, New York 36, N. Y.

What's New IN THE INDUSTRY

National Tube division of U.S. Steel Corp. boosted its prices for smaller-diameter casing by an average of 1% last week. The increases, effective Mar. 18, apply to all grades of 4½-in., 5-in., and 5½-in. casing. Prices are unchanged on the larger sizes: 6⅝-in. through 20-in.

•

The Texas Land Owners, Royalty Owners & Gas Producers Assn. was formed last week to support a bill that would legalize the Railroad Commission's gas allocation formula.

Specifically, the new group has pledged support to legislation that would give the commission discretion in basing gas allowables on a one-third well and two-thirds acreage formula (PW —Mar.17'61,p11). Such a formula had been in use until the State Supreme Court ruled that its application to a 0.3-acre tract in the Normanna field of Bee County was illegal. Stanley B. Woods, president of Woods Exploration & Producing Co., was named temporary president.

•

Texaco Inc. this week awarded Bethlehem Steel Co. contracts for construction of five 25,300-ton tankers. Delivery of the first vessel is expected in the second half of 1962. The ships will be used principally for coastwise shipments from the company's Port Arthur (Tex.) refinery to ports north of Cape Hatteras. The tankers will replace ships built during World War II, which are in the 16,000-ton class.

•

Small refiners are trying to come up with a way to get more business from the Military Petroleum Supply Agency under small business "set-aside" procedures. At least six small independent refiners are now working on the plan. They expect MPSA to take steps to implement President Kennedy's directive to all defense procurement agencies to boost the volume of business given to small business by 10% over last year's volume.

•

There has been a noticeable slowdown in both cash and ABC types of acquisitions, and a definite upturn in absorptions through tax-free exchanges of stock. That's the observation of Eugene McElvaney, senior vice president of the First National Bank in Dallas. McElvaney was speaking to the concluding session of the International Oil & Gas Educational Center's first institute on the economics of petroleum exploration, development, and property evaluation, in Dallas.

McElvaney added, though, that acquisitions, particularly those of magnitude, are subject to Justice Dept. investigation.

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The date of the midyear meeting of the Interstate Oil Compact Commission has been advanced to June 1-3, in Houston. The originally scheduled date, June 19-21, conflicts with the U.S. Governors Conference in Hawaii.

Gov. Price Daniel of Texas, chairman of the compact commission, at an executive committee meeting this week, appointed a five-member committee to study a national fuels policy and to investigate proposals for area price regulations on natural gas.

•

Members of the Natural Gasoline Assn. of America are now voting, by mail, on a proposal to change the organization's name to Natural Gas Processors Assn. NGAA directors have already approved the title. If adopted, it would be the third name for the association, which was founded in 1921, and first known as the Assn. of Casinghead Gasoline Manufacturers.

•

The Feb. 23 lease sale on Navajo Indian Reservation land in San Juan County, N.M., brought nearly $2.4-million in bonus bids, the Interior Dept. said this week. The bids were on 32 tracts covering 57,063 acres. The average bonus was $42 an acre. Bids on four tracts, totaling 9,560 acres, were rejected.

•

Interstate gas transmission firms cannot sell direct to industrial customers within the territory of local utility distributors, a Federal Power Commission examiner has ruled. Robert M. Weston denied the application of Southern Natural Gas Co. to provide direct interruptible gas service to two Savannah (Ga.) industrial users on the principle that lines of interstate transmission companies should not be "laid on top of local distribution lines."

Looking Ahead in Washington

McGraw-Hill
Washington Bureau

March 24, 1961

Russians will inspect the U.S. natural gas industry; then an American team of gas men will visit the U.S.S.R. Both countries have agreed to the exchange, and final details are now being worked out. The swap will be like last year's trips by oil men: There will be about ten on each team, and the tours will last about four weeks. Just as the American Petroleum Institute sponsored the oil exchange, the American Gas Assn. will be behind this one. The State Dept. is negotiating the exact dates and itineraries. It's probable that the Russians will come in May, and that the U.S. group will visit Russia in July.

•

Foes of U.S. participation in an international commodity agreement for oil will find ammunition in a new World Bank study of Venezuela's economy. The report, by a mission of the International Bank for Reconstruction & Development, notes the past stability of Venezuela's oil income, and anticipates relatively stable—but somewhat lower—prices in the future. The report also comments that it would be hard to find another commodity as free of extreme fluctuation as oil.

The man who headed the mission, Henry R. LaBouisse, is now top Kennedy aide on assistance for underdeveloped countries in his new post as Director of the International Cooperation Administration. The chief reason for Kennedy's interest in commodity agreements is as a means of protecting underdeveloped producing countries from the hazards of wildly fluctuating prices.

•

Import controls on crude and products will get a top-to-bottom review, probably this spring. Interior Dept. officials turned to the basic program as soon as they had polished off changes in residual fuel controls. They are talking in terms of action in April or May.

Public hearings seem a certainty, and they will be longer than the single day devoted to resid. Questions being discussed: Should hearings on District 5 be handled separately from Districts 1 through 4? Should Interior propose some changes as the basis for public hearings, or throw the doors open to suggestions from all comers?

Opponents of controls will have their day in court. Every action by Interior Secretary Stewart L. Udall and his subordinates points to continued support for controls. But a study on U.S. trade policy by Sen. Warren G. Magnuson's Commerce Committee questions the wisdom of using up U.S. reserves, and the need for depriving U.S. consumers of the benefit of lower foreign crude prices. Emphasis will be on finding machinery to avoid the cartelization of imports.

•

Congress probably will go along with Kennedy's plan to keep gasoline taxes at 4¢ a gal. That's the prediction of some observers of House Ways & Means Committee hearings on the federal highway tax package. They expect the program to be kept on schedule, for completion by 1972, and they anticipate some compromise to ease the burden on heavy trucking.

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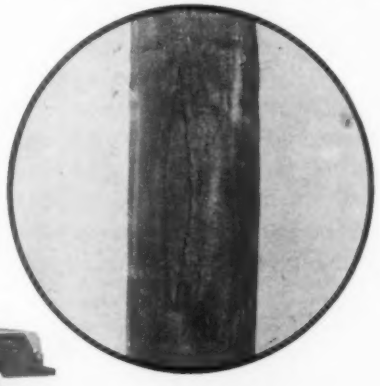
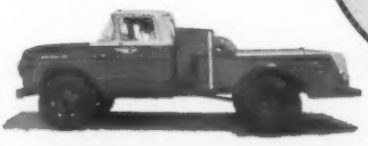


Impression of casing leak



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Continuous-Core Drilling Is Workable

Field tests of a continuous-core drilling rig indicate the method works. But while the cost of obtaining cores is less than conventional coring, costs of drilling are higher.

These are some of the highlights of the drilling method, called the Kore Drill, outlined this week by Homer I. Henderson, of Strato Drill, Inc., Houston. Henderson reported the test findings at the Southwestern District, Division of Production, American Petroleum Institute meeting in Albuquerque, N.M.

He explained that a continuous-core drilling rig is just what the name implies—as it bores into the earth it leaves a central core that is broken off automatically and carried to the surface. This provides the geologist and the driller with a continuous sample of the geological section being drilled, and this sample is obtained roughly simultaneously with the drilling.

The rig has been used to core over 12,000 ft. of hole in Harris, Bastrop, Crockett, and Shackleford Counties in Texas.

The experimental rig uses a dual, concentric drill string. Cores are broken off in 6-in. lengths and carried to the surface through the inner core tube by means of reverse circulation.

The size presently being tested is 4½-in. outside diameter drillpipe in a 4¾-in. hole, Henderson said.

The core tube within the drillpipe has a diameter of 2½ in.

The drilling fluid descends in the annulus between the drillpipe and the core tube, discharges into the hole annulus just above the bit, and ascends within the core tube.

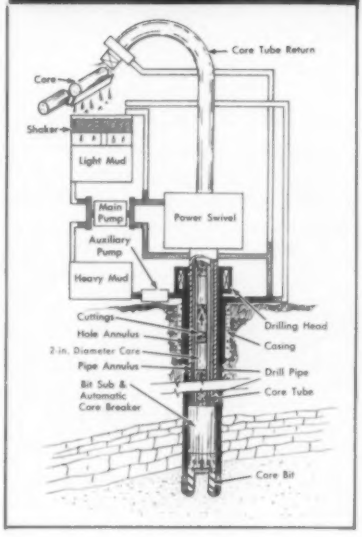
The core is automatically broken off by a core breaker located just above the bit (see drawing). Both drag (blade) type bits and diamond bits have been used. The core segments, as well as cuttings, are carried upward by the fluid, through the swivel and then through the goose neck to a shale-shaker screen.

Two mud tanks are used, one for light mud that is circulated as the drilling fluid, and the other for heavy mud, which is held in standby for possible use in the hole annulus and for killing any gas blow.

Drillpipe rotational speed range is from zero to 350 rpm., Henderson continued. The pipe is made up and broken out with the power swivel.

Henderson added that any normal-size hole can be drilled by use of the proper size bit, either core bit or full-hole bit, which can be used in sections where no cores are needed.

Continuous-Core System



Holes drilled with the Kore Drill have been straight. Surprisingly, there has been virtually no hole caving or sloughing.

Henderson reported that holes were never off vertical as much as one degree.

On the other hand, the lack of hole caving or sloughing was not anticipated, leading Henderson to report that "it is believed that in conventional drilling, the deleterious effect of the ascending mud flow is much greater than heretofore was generally thought."

Henderson noted that mud flow in conventionally drilled holes has a velocity between 120 ft. and 180 ft. per minute, and is laden with sharp rock particles that are effective cutting tools. This combination, he continued, makes for rapid erosion of the hole walls.

"Probably, what is still more deleterious to the shale sections," he said, "is the water-base mud flowing by a water-thirsty shale section 24 hours per day, causing considerable hydration, swelling, and sloughing of the shales."

He noted while research drilling was being carried out in the Permian Basin, daylight tours were drilled and the pipe let on bottom overnight, "with no trouble whatsoever insofar as sloughing was concerned."

One hole, at 2,100-ft. depth (of which 1,900 ft. was open hole) was left standing for seven weeks, he continued, and upon re-entry was found to have only 2 ft. of sloughing material in the bottom of the hole.

Core recovery in the tests was 100% in most cases.

Henderson reported that cores have been recovered that one would never expect to get in conventional drilling. For example, he added, friable sands that can be crumbled with one's fingers, and clay and sand-clay cores that can be squeezed through one's fingers can be cored.

The economics of the Kore Drill, however, remain in doubt, with its future contingent on further developments.

Henderson said that while cost of the experimental drilling with the prototype drill has been "considerably" more than with conventional drilling, "this is to be expected in all development programs.

"Just what are the eventual actual relative costs per foot compared to conventional drilling is still not determined. It is possible that the cost per foot will always exceed conventional drilling costs."

Right now, he added, it seems assured the method can lead to savings in drilling shallow core holes.

There are costs other than cutting the hole that must be considered, however.

The Kore Drill, Henderson said, can effect savings by the drilling of slim holes and by saving on logging costs.

The method also can effect savings in exploration drilling, such as providing a "key" log to revaluate older logs, by giving definitive data on areas surveyed many times in the past by geophysical means, and by aiding in searches for stratigraphic traps.

The Kore Drill also permits drill-stem testing without pulling pipe. Henderson said this makes it possible for the operator to test and drill until he either gets a "keeper," runs out into water, or runs out of pay.

And the geologic information obtained from the continuous cores makes possible better control in locating development wells.

How to Cut Lease Operating Costs

Operators can reduce lease operating expenses through better supervision and better utilization of pumper labor.

Hiram E. Bond of Atlantic Refining Co. told the spring meeting of the Southwestern District, Division of Production, of the American Petroleum Institute at Albuquerque, N.M., that operating economy is an important factor in view of the steady reduction in profit margins that has faced most companies.

Improved economy already has been effected through a number of engineering recommendations, such as lease automation, corrosion control, tubular goods design, fracturing treatment, wider well spacing, operations research, and data transmission.

Supervisory efficiency can be improved by training programs that assist in improving supervisors' abilities in dealing with people, making constructive corrections, giving effective orders, and delegating authority.

Supervisors must be made conscious of spending money wisely to achieve the greatest possible return for every dollar spent.

Bond said that economies are not necessarily achieved simply by stopping spending. When considering any expenditure, the supervisor must be sure that some service or equipment really is required and that what he chooses is best for the task.

Proper procedures and frequencies should be set up for routine lease maintenance operations, such as cleaning and painting.

More efficient lease operation can be gained by cutting crew size to two men, indicated by time and method studies to be the best size.

With four- or five-man crews, more than 20% of the crew's time is spent in traveling, Bond said.

When a job requires more than two men, several crews can be combined temporarily.

Significant savings can be made through close watch on well servicing operations and equipment selection and by reducing accidents.

A considerable saving in rod-pump repair costs can be made with the use of an adequate cost-accounting system that includes complete repair reports on pulling-unit expense, material repair costs, days of service, and cause of failure.

The use of dynamometer and other tests can help eliminate premature pulling of pump rods. (Rod-pump repair shop operators say 30% of the pumps sent in for work are not sufficiently worn to need repairs.)

Selection of the proper inhole equipment is important. Special pumps should be used only for the purposes for which they were designed, he added.

Savings achieved through reducing the number of accidents can be considerable. The average accident costs the operator $2,200, he reported.

Achieving maximum worth from pumper labor through setting up of performance standards can be a big factor in cutting costs.

By setting up time performance standards for a job, management can determine just what it costs to have the job done. It can then decide on a businesslike basis whether the job is economically worthwhile and, if so, how often it should be done.

He added that a certain amount of labor is wasted on leases because various maintenance checks and routine inspections are made more often than necessary. In some areas, operators have been able to leave leases unattended for two days or longer.

Use of performance standards has enabled management to modify job assignments and improve manpower utilization to the extent that payroll costs for lease operation have remained constant since 1953, Bond said, though there have been five pay raises since then.

Rotary Rigs Available Decline

There were 2,270 rotary rigs available for service in the U.S. and Canada as of January this year, down 201 from the same time a year ago.

This is one of the highlights in the second annual rig survey made by Mission Manufacturing Co.

The state-by-state survey shows that the rigs were operated by 877 contractors, including 57 in Canada, giving an average of 2.6 rigs per contractor.

The full survey covers 128 pages and shows location of rigs by counties, size and make of pumps on rigs, and other information.

The Mission Manufacturing Co. survey shows Texas in the lead with 690 rotaries available, followed by Louisiana and Oklahoma, in that order.

The Texas total was down from the 751 recorded in the first survey. Louisiana's count of 317 also was down from 388 last year, while Oklahoma's total of 288 was up from 273.

California also showed an increase, rising from 121 last year to 153 this year.

In Canada, 143 rigs of the total 185 were operated in Alberta, with British Columbia next with 31.

There were 520 rigs stacked, with Kansas having the greatest number, 67.

Alberta followed with 58 stacked rigs, Northern Oklahoma had 44, and the Texas Panhandle 37.

	Contractors	Rigs	Pumps	Rigs Stacked
Alabama	5	6	12	
Alaska	2	5	10	
Arizona	3	3	5	1
Arkansas	9	11	17	1
California	54	153	307	19
Colorado	25	34	47	6
Florida	3	3	5	1
Illinois	41	58	58	18
Indiana	15	20	20	3
Kansas	85	144	154	67
Louisiana				
Houma Area	39	80	216	6
Gulf Coast	50	94	257	3
Northeast	8	12	18	4
New Orleans	45	90	227	20
Shreveport	24	41	74	
Michigan	24	48	68	8
Mississippi	34	77	145	32
Montana	6	7	14	
Nebraska	17	29	29	6
New Mexico	65	131	197	33
North Dakota	3	6	12	
N. Oklahoma	90	160	224	44
S. Oklahoma	67	128	209	28
Oregon	1	1	2	
Texas				
East Texas	35	73	135	
Far West Texas	18	27	43	9
Houston Area	60	96	217	24
Midland Area	65	125	220	12
North Texas	47	63	66	7
Panhandle	53	98	151	37
Snyder & Andrews	30	41	50	12
S.W. Texas	63	97	299	25
Texas Gulf Coast	45	70	191	4
Utah	19	27	42	9
Wyoming	15	23	39	1
Canada				
Alberta	36	143	255	58
B. C.	15	31	56	18
Ontario	1	1	1	
Saskatchewan	4	9	11	2
N. W. T.	1	1	2	1
TOTALS	**877***	**2,270**	**4,110**	**520**

*Total Contractors operating in U.S.A. and Canada. Column totals to 1,224 because of some contractors operating in more than one state.

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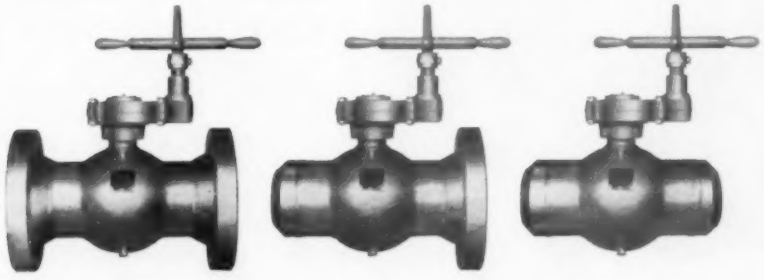

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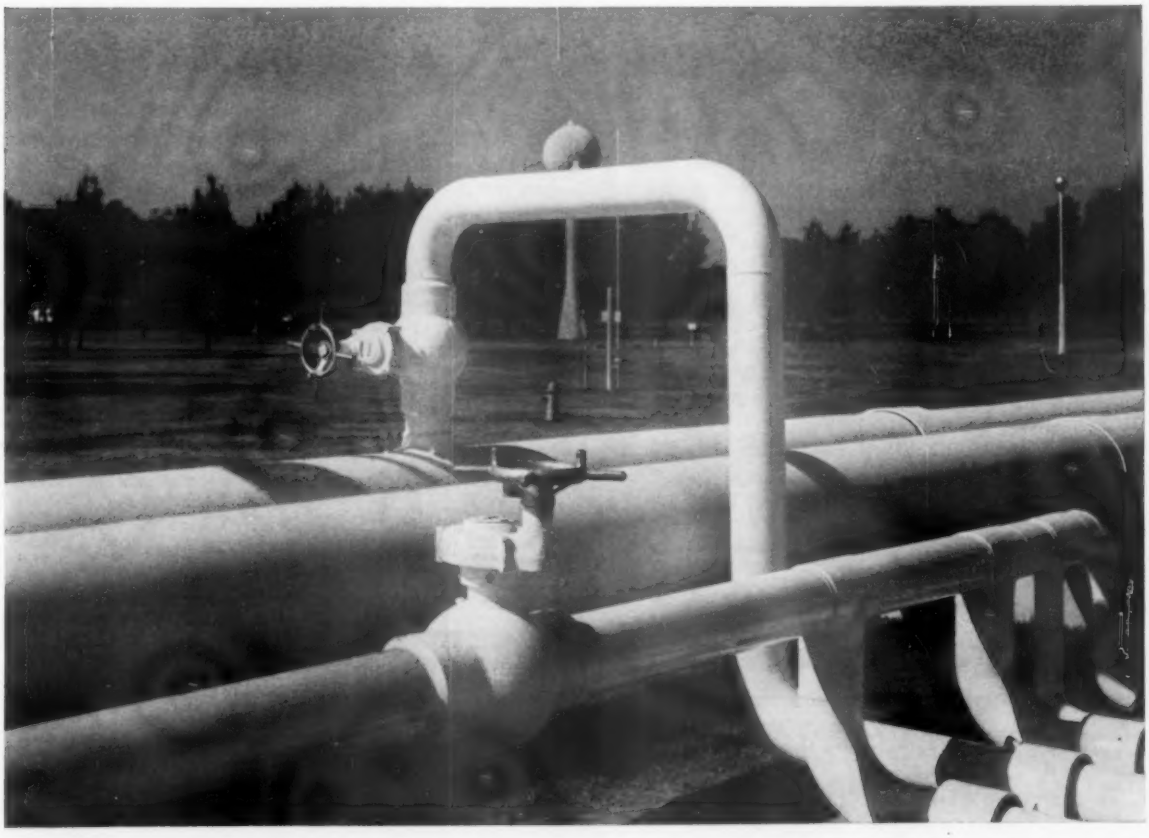

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Output Is High on

Federal and Indian lands are becoming increasingly important in the Southwest oil picture.

That was underscored this week by John A. Anderson, of the U.S. Geological Survey, in a report to the meeting of the Southwestern District, Division of Production, American Petroleum Institute, in Albuquerque, N. M.

Last year, production from these lands accounted for more than 72-million bbl. of oil and some 370-billion cu. ft. of gas, Anderson said.

In New Mexico alone, these lands contributed 32-million bbl., almost one-third of the state's total 1960 oil output of 108-million bbl. They also accounted for 371-billion cu. ft. of the state's total of 843-billion cu. ft. of gas.

"Of the 78-million acres of land in New Mexico," Anderson noted, "27-million acres are federal lands owned by the U.S., and about 7.5-million acres are Indian land."

Anderson pointed out that the Geological Survey supervises oil and gas operations on public, acquired, and Indian land, and on the outer continental shelf.

It has several regional offices to supervise these operations, including the southwestern region, which is composed of New Mexico, Arizona, Utah's San Juan County, Southwestern Colorado, and lands west of the 100th meridian in Texas.

Oil and gas produced from federal lands in the southwestern region netted a royalty of $17,134,000 in 1960.

Production came from 2,168 producing public-land leases, covering 1,699,000 acres, on which there were 4,886 oil wells and 3,958 gas wells.

This royalty excludes $10,000 earned on some gas from military and acquired lands in Texas.

The states in which federal lands are located get most of the benefit from royalties, rentals, and bonuses derived from oil and gas operations on that land, Anderson said.

By law, 37½% of the revenues are paid to the state in which the land is located, to be used for schools and roads, he said. Another 52½% go into the reclamation fund, to be used in construction of various reclamation projects, most of which are in the western part of the country, where there are large amounts of public lands. Only 10% of the revenues, Anderson said, go into miscellaneous receipts of the U. S. Treasury.

"For example," he added, "in the

U.S., Indian Lands

calendar year 1960, the state of New Mexico received $8,099,000 as its share of mineral revenues from public lands in New Mexico. The total amount of money paid the state of New Mexico from such revenues during the period 1920-1960 is $64,024,000. These payments include receipts from potash, coal, and other leasable minerals."

Oil and gas produced from Indian lands—both tribal and allotted—in the southwestern region netted $15,364,000 in royalty in 1960.

Production came from 399 leases covering 681,500 acres, on which there are 1,250 oil wells and 915 gas wells, he said.

The biggest chunk of royalty—an estimated $12¼-million on tribal leases and $755,000 on allotted lands—went to the Navajos.

Navajo Indian reservation land—totaling 15-million acres—is held in common by members of the tribe. There are some 4,000 Navajo allotments covering 655,000 acres, mostly outside the reservation, in New Mexico.

No dividend payments from tribal income are made to individual Indians. But certain monies are appropriated for business and other enterprises for the betterment of the tribe. Bonuses from oil and gas leases over the past ten years have aggregated $77,330,000 on tribal lands and $3,652,000 on allotted lands.

The Jicarilla, Southern Ute, and Ute Mountain Indian reservations account for most of the rest of the royalty.

All three tribes pay periodic dividends to their members.

The last dividend to each Indian on the Jicarilla reservation was $250. The reservation had a royalty income estimated at $654,000 in 1960. Lease bonuses received by the tribe over the past ten years aggregated over $8-million.

The last dividend to Indians on the Southern Ute reservation was $800. Estimated royalty for last year was $156,000 on tribal lands and $1,600 on allotted lands. Bonuses for leases over the past ten years have aggregated $5,395,000 for tribal land, and $303,000 for allotted land.

The last dividend to each Indian on the Ute Mountain reservation was $1,000. Last year the reservation had a tribal lease royalty estimate of $706,000. The ten-year lease bonus total was over $26.6-million for the tribe, and $183,000 for allotted land.

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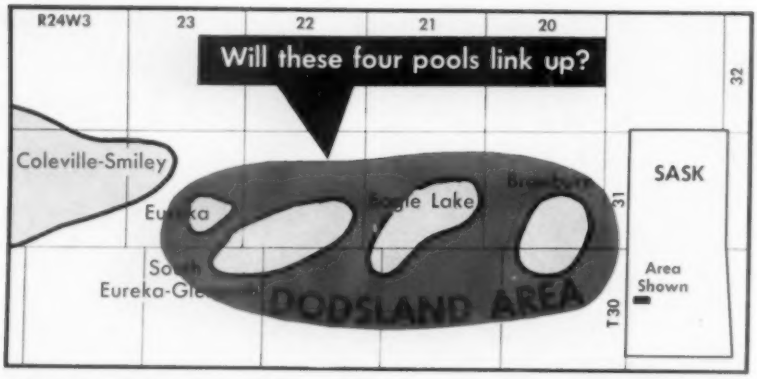


VIKING SAND POOLS would form reservoir 20 mi. long if linked. They might, as . . .

Dodsland Field Develops Briskly

The Dodsland area of west-central Saskatchewan is developing briskly, in contrast to the general trend in the province.

Some 100 oil producers and 14 shut-in gas wells were reported at the end of 1960, compared with 9 oil wells and 11 gas wells at the start of the year. Drilling has continued active this spring, with the prospect of 100 more holes before year-end, on the basis of existing 80-acre spacing.

Small independents are the busiest operators in the area. They like it because production is not restricted by government regulation, and there is a ready market for almost all of the oil produced. Some half-dozen independents and their associates are producing in the field.

Sarcee Petroleum, Ltd., has been involved in 72 of the 115 wells completed, with its interest ranging from 6¼% to 100%. Initial development of the field by Sarcee and United Canso Oil & Gas, Ltd., started 18 months ago.

Among the other companies active in development are Canpet Exploration, Ltd., frequently a Sarcee partner; Sun Oil Co.; Canadian Homestead Oils, Ltd.; Tidewater Oil Co.; and Guyer Oil Co.

Most wells can be drilled quickly (three days, usually), and average payout time is 27 months, with average production of 30 b/d. The $35,000 typical cost per well includes installation of pumps and production batteries.

Some wells that were produced at unusually high rates to meet special local demand enabled the operators to recover their costs in as short a time as 17 months.

The area consists of four Viking sand pools, which may turn out to be all part of one reservoir 20 mi. long (map).

None of the four pools—Eureka, South Eureka-Gleneath, Eagle Lake, and Braeburn—is separated by more than 2½ mi. If they should be joined, they would form one long pool stretching from east to west across four townships. The area is immediately east of Coleville-Smiley pool.

The Viking sand is relatively thick, considering the shallow depth at which it is found. At an average depth of 2,350 ft., the Viking, plus an underlying fragmental chert, offers gross pay sections totaling 26 to 30 ft.

Operators have had trouble maintaining a steady flow from some wells. But improved completion techniques have helped.

"Barefoot" fracturing is often used. This involves the forcing of 30,000 to 100,000 lb. of light sand directly into the formation. Production casing is set to the top of the sand and no perforations are made.

The method has worked well in most cases, allowing some wells to produce initially up to 200 b/d before they settle down to around 30 b/d.

Dodsland crude is 36-gravity and water-free. Some of it is mixed with heavy-gravity Coleville-Smiley crude to facilitate flow of the Coleville-Smiley oil through the Interprovincial Pipe Line system.

Royalite Oil Co. has built a pipeline from the South Eureka and Gleneath pools into the Coleville area. Dodsland crude is currently trucked out of the Eagle Lake and Braeburn pools.

Gas reserves have been discovered just north of the oil area.

There are 14 gas wells so far, but all are capped pending build-up of demand by Saskatchewan Power Corp., which has a pipeline running through the area.

Further Tests of Spiral Pipe Planned

This unique, 2,500-ft. string of spiral drill pipe, designed to prevent downhole wall sticking, has been successfully tested on a well in the Ship Shoal area off the Louisiana coast.

The 3½-in. pipe, manufactured by Pritchett Engineering and Machine, Inc., and distributed by the National Supply Division of Armco Steel Corp., has been tested to 10,000 psi. But Engineering Enterprises, Inc., which is testing it, says it will test the pipe further on at least 2,500 ft. of hole before offering it to the industry.

Mobil Revives Profits in Old Field

Turnkey contracts and slim-hole completions: Mobil Oil Co. prescribed these as restorative measures in 1960 for an aging, money-losing California oil pool. The remedy has taken good effect.

Fifty-year-old Lost Hills pool, 45 mi. northwest of Bakersfield in Kern County, was down to a near-stripper production of 3,470 b/d from its 550 wells in early 1960. Now, one year later, 47 new wells have been brought in, and the production total has risen to 4,537 b/d.

An increase in low-gravity crude prices had prompted Mobil's management to seek a low-cost rejuvenation of Lost Hills production.

In mid-September, 1960, the price of 14-gravity oil and below increased by 10¢ a bbl. Oil above 14-gravity brought lesser increases, declining to 1¢ a bbl. for 22-24-gravity oil.

Although the higher prices made increased production of Lost Hill's 16-17-gravity oil a tempting prize, the "normal" well completion cost (an average of $27,000 in 1957 for Mobil) was prohibitively high.

The answer seemed to lie in a program proposed by a Pacific District study group led by J. J. Oliphant, production superintendent, and K. B. Green, district engineer.

The program succeeded in enabling Mobil to cut drilling and completion costs to about $13,000 per well.

Under the program's first proposal, turnkey contracting, Mobil agreed to furnish the contractor with such materials as conductor pipe, casing, macaroni tubing, and pumps. Mobil stockpiled these materials on its lease at Lost Hills.

The contractors agreed to furnish all expendable supplies, including mud—although the operator offered protection in case of lost circulation.

The contractor also took on the responsibility of building the locations, hauling equipment from Mobil's stockpile, logging the wells, testing, and running of macaroni tubing and pump. Electricity was furnished the contractor by the operator.

The study team's second key cost-cutting proposal was for adoption of slim-hole drilling techniques.

The casing program was changed from 6⅝-in. casing, used by Mobil in 1957, to a 4½-in. string. In place of conventional tubing and rods, the operator used 1½-in. macaroni tubing with macaroni pumps.

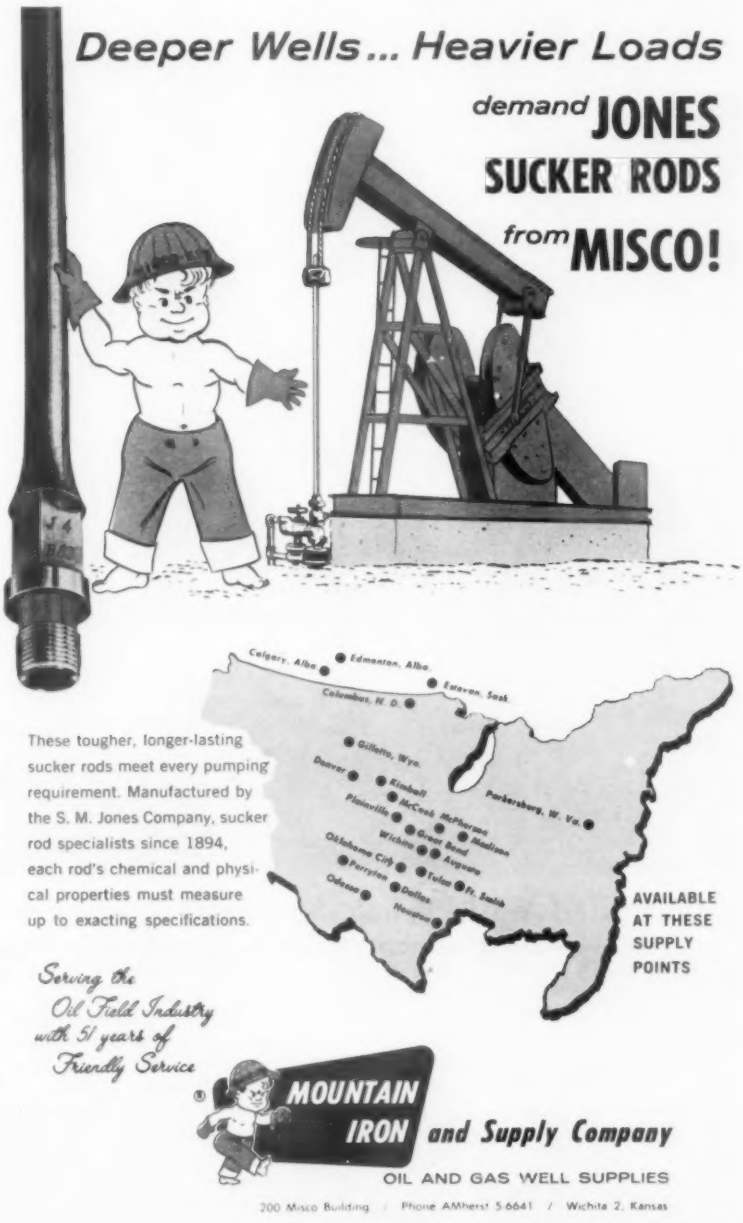
A pilot group of ten wells was drilled last summer. The wells were completed in July to an average depth of 1,720 ft., at an average cost of $13,200—a little more than half the cost of completing a well in 1957.

Initial production per well averaged 21 b/d. Today, the same wells average 15 b/d, totaling 150 b/d for the ten.

The program was resumed last October, and 37 wells were completed by the end of December. As many as five contract drilling rigs were working simultaneously last fall to complete the program before the end of the year.

The program resulted in additional production of 875 b/d of oil, and 1.5-million cf/d of gas.

According to one company spokesman, the program's success will probably lead Mobil to continue drilling at Lost Hills and in other low-gravity pools with similar production problems.



What's New / IN EXPLORATION, DRILLING, PRODUCTION

Mohole Project Moves Into Second Phase

Scientists have moved into the second stage of the Mohole project to penetrate the earth's crust by commencing drilling in water 12,000 ft. deep in the Pacific off Guadalupe Island.

The effort, 300 mi. south of San Diego, follows the initial test in 3,000 ft. of water, which was called "tremendously encouraging" by Willard Bascom, project director. The initial test penetrated 150 ft. into the sea bottom, which also was cored.

The drilling barge CUSS 1 is being used as a free-floating platform in the project.

•

Shell Taking Survey Off Oregon Coast

Shell Oil Co. is making electronic soundings off the Oregon coast and hopes to do some seismic exploration later in the spring.

Shell's move came while the Oregon legislature considered a bill concerning disposition of oil rights on the state's 600,000 acres of offshore lands.

Shell applied last year for exclusive rights to Oregon's offshore lands, but was rejected on the ground that specific legislation was required before there could be any authorization of oil and gas leases on the offshore lands (PW—Dec.23'60,p22).

•

Skelly Oil Co. is placing all of its exploration activities, lease, land, geophysical, and geological, under the direction of a new exploration department.

Joseph E. Morero, previously head of geology and geophysics, will head the new department. The reorganization was made because A. L. Cashman, senior vice-president, land lease, will retire later this year.

Operators hope to recover more than 36-million bbl. of additional oil with secondary recovery at four Texas pools.

Pan American Petroleum Corp. plans to waterflood its 16,089-acre Midland Farms unit, Andrews County. The expected increase in recovery is more than 25-million bbl.

In another application to the Texas Railroad Commission, Pan American reported it also hopes to recover 2.8-million bbl. by a waterflood project at its Corsica unit in Stonewall County.

Humble Oil & Refining Co. expects 5-million bbl. additional oil recovery with an LPG-injection project, approved by the commission, at the Neches Sub-Clarksville pool in Anderson County.

In another application, Wilcox Oil Co. estimated it will recover 3,465,000 bbl. of additional oil with a waterflood project at its Wilcox-Combs Lease, Panhandle Gray County pool, Gray County.

•

Triad Oil Co., Ltd., has bought the producing properties of Home Oil Co., Ltd., in the Redwater area of Alberta.

The $7-million purchase included 18 net oil wells in the area, 20 mi. west of Edmonton.

•

Texas Amerian Oil Corp., Midland, Tex., has acquired working and royalty interests in 30 producing wells in West Texas. The purchase was made from B. W. Wiseman of Midland.

The properties include 20% working interest in 18 oil and gas wells, five of them dual producers, and a royalty interest in 12 wells, ten of them dual producers.

•

The second edition "Measuring, Sampling and Testing Crude Oil," is available from the American Petroleum Institute.

The new edition contains information on measuring liquid volume, temperature measurement, sampling, gravity determination, vapor pressure determination, and quality adjustments and calculations.

The publication is available from

Pipe Pulled With Truck-Mounted Crane

This novel, truck-mounted crane is helping Phillips Petroleum Co. field personnel reduce pipe-loading time in the unitized North Burbank pool, Osage County, Okla.

The crane, designed by Phillips engineers, is a modified Pitman Hydralift Model 160-B crane mounted on the back of a cab-over-engine Mack truck.

The crane is powered by an hydraulic system which drives the winch, raises, swings, and telescopes the boom, and sets outriggers to the ground for stability. The hydraulic pump is powered by a take-off from the truck motor.

The unit was designed to handle pipe pulled from old wells being plugged for repressuring work in the unit. The pulled pipe is trucked to a central pipe yard at Shidler, where it is resold or restored for use. The unit, in service since November, 1960, has enabled two men to do work previously handled by four men and a truck, the company reports.

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Consolidated Oil & Gas, Inc., Denver, and Midland Oil Co., Cheyenne, have merged. Consolidated Oil, the surviving corporation, now has an interest in more than 200 oil and gas wells in the Rockies and Texas.

•

A natural gasoline plant capable of handling more than 150-million cf/d of gas is expected to be completed by July 1 near Haughton, La. Texas Natural Gas Corp. will use the plant to process some 125,000 gal. of propane, butane, and natural gasoline daily from gas produced on the Barksdale Air Force Base reservation in Bossier Parish.

•

Engineering

Packaged field compressors that provide up to 1,000 brake horsepower and are mounted on a single 35-foot skid are being introduced by Clark Bros. Co., Olean, N.Y., one of the Dresser Industries.

The company says the units driven by gas engines, are complete with radiator, scrubber, and accessories, and are especially suitable for field gas gathering, offshore mounting, gas lift, and multiple service applications.

•

A small, lightweight buoy containing an electronic marine position-determining system has been developed that can operate independent of shore facilities.

The completely transistorized system, developed by Hastings-Raydist, Inc., Hampton, Va., operates like a conventional Raydist station to give distance continuously and automatically between it and a vessel or aircraft. The 45-lb. buoy can operate for 14 hours with dry-cell batteries, or longer if wet cells are used.

•

A balanced-opposed compressor has been designed for high speed unattended operation in oil and gas fields.

The CUB (for Compressor Unitized and Balanced) unit can be used for gas gathering, gas lift, repressuring, and other field uses involving semiportable compressor units of between 200 hp. and 350 hp. The CUB, designed for direct coupling to a high-speed gas engine, was developed by Worthington Corp.'s Compressor & Engine Division, Buffalo.

Tests Indicate Nuclear Subsurface Blast Safe

Tests indicate that an underground nuclear explosion to extract oil from shale probably would not release radioactive gases into the atmosphere.

Chemical explosions conducted by the University of California's Ernest P. Lawrence Radiation Laboratory at the Rifle (Colo.) shale mine of the U.S. Bureau of Mines indicated gases from the explosion did not escape to the surface. The chemical blast was used because the government has suspended nuclear testing.

The explosive gases tend to expand more or less spherically, rather than in a direction parallel to the bedding-planes, the tests indicate.

It has been proposed that in-place reduction of oil shales be employed in the Green River formations of Utah, Colorado, and Wyoming with nuclear explosions.

Drilling Highlights

Alabama—Hunt Oil Co. No. 1 Tyler Odom, section 13-4w-3n, Washington County deep test that has set a new depth record for the state, reportedly had a gas show at around 18,200 ft. The hole, now being drilled tight, is more than 6 mi. northwest of Citronelle pool. It also is more than 2,500 ft. deeper than the previous deepest hole in the state. Alabama's only gas production is in the shallow Bethel sands at Hamilton and White House fields in Marion County, in the Black Warrior Basin.

East Texas—S. A. Cochran and R. W. Bradshaw No. 1 Joe Densmore, Henry G. Hudson survey, Panola County, was completed for 6.8-million cf/d of gas on open flow and 16 bbl. of condensate per million cu. ft. through perforations at 6,270-82 ft. in the upper Rodessa (lower Cretaceous). The opener is 7 mi. southeast of Rodessa production, in Minden field.

Kansas—Empire Drilling Co. No. 1 Schmahl, section 9-5s-31w, Rawlins County, flowed at the rate of 18 bbl. of oil per hour through perforations at 4,156-62 ft. in the Kansas City. Operator is installing pump at the well, 11 mi. southeast of Waterman pool.

West Texas—Texaco Inc. No. 1 N. B. Birge, section 1, block C43, public school land survey, Gaines County, flowed 102 bbl. of 45-gravity oil through ⅜-in. choke on two-hour test at 10,060-100 ft. in the Strawn. Gas volume was 86,000 cf/d. On a later test at 11,100-35 ft., 43 bbl. of oil and 75 bbl. of water were recovered. Operator is drilling ahead on the prospect, 2 mi. northeast of the Champmon Devonian area.

Northwest Louisiana — Arkansas Louisiana Gas Co. No. 1 Newton H. Kavanaugh, section 22-17n-3w, Jackson Parish, was dually completed for 6.2-million cf/d of gas through ⅜-in. choke and perforations at 7,668-82 ft. in the Travis Peak, and for 3,750,000 cf/d of gas through ⅜-in. choke and perforations at 10,286-312 ft. in the Cotton Valley. The opener is 2½ mi. south of Clay field.

North Texas—Cooperative Refining Assn. No. 1 Coody, block 42, Orange County school land survey, Clay County, flowed 351 b/d of 40-gravity oil through 20/64-in. choke and perforations at 4,953-78 ft. in the Strawn section of the Pennsylvanian. The discovery is 2 mi. southeast of the Ambassador Mississippian pool.

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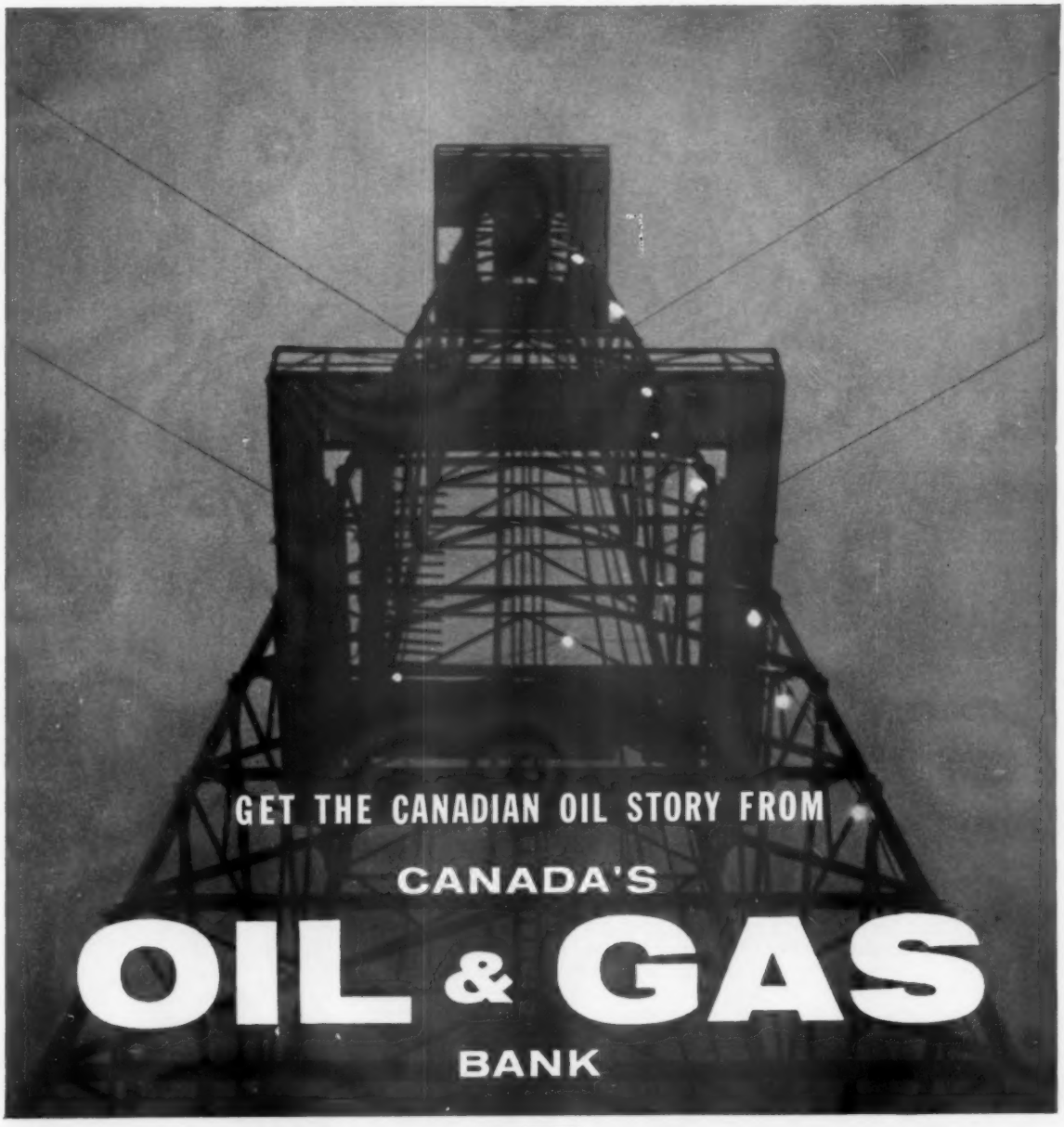

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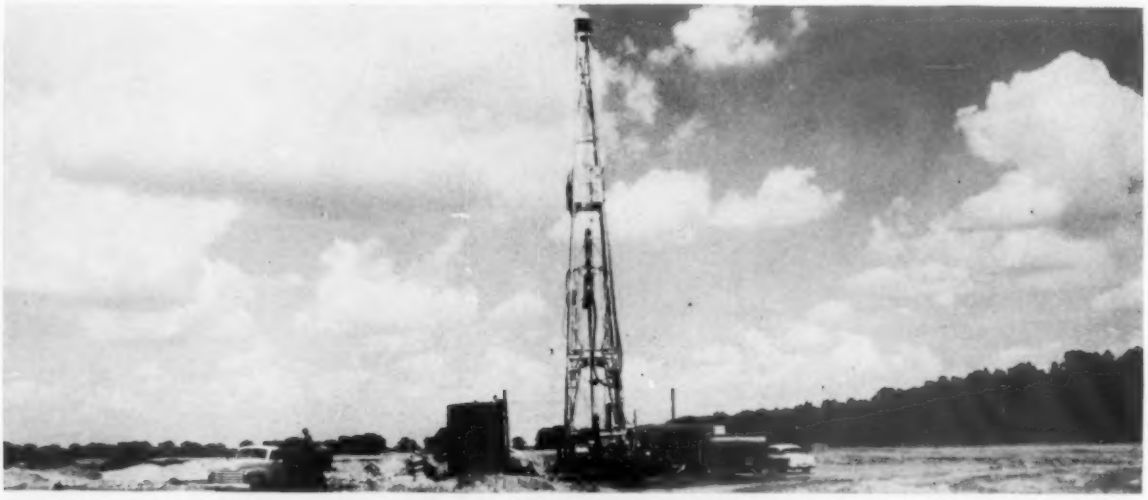


TWELVE WELLS for injection and withdrawal of gas were drilled in this depleted field at Alden, in central Kansas, where . . .

Cities Service Drills to Store Gas

Injection of gas will be started this spring in Cities Service Gas Co.'s newest storage field at Alden, Kan. The field is the company's second biggest, and the deepest it has developed to date.

The company now has storage fields at nine locations in Kansas.

The Elk City field has the largest capacity—20-billion cu. ft.

With completion of the Alden field, the number of storage wells drilled by Cities Service Gas totals 546. Combined capacity is over 89-billion cu. ft.

The wells are supplied by the company's 6,800-mi. pipeline system, which takes gas from fields in Kansas, Oklahoma, and Texas.

Storage capacity in the depleted Alden field is 14,773,000,000 cu. ft.

The field is situated just west of Sterling, in Rice County. It produced gas from the Misener formation from May, 1938 to December, 1945.

The field has 12 storage wells, which were drilled to a depth of 3,318 ft.

Until development of Alden, deepest field operated by the company was at McLouth, Kan., where wells were drilled to 1,427 ft.

The company points out that it was willing to bear the cost of the deeper drilling because it was still well under the cost of building additional pipelines to handle peak-day needs.

The striking differential between the cost of creating underground storage facilities for gas and of building pipelines of comparable capacity has been the reason behind Cities Service Gas's search for suitable fields in Kansas—its major market area.

The experience of two other companies in providing underground storage facilities to meet their peak-day requirements underscores the gap. The companies, both Michigan utilities, reported that the cost of reservoirs to store the gas they needed was $94-million, whereas the cost of pipelines that would have been necessary to deliver the gas directly to market would have been over $300-million (PW—Jul.1'60,p34).

Cost of developing the Alden field is $2-million, which reflects the higher costs of the deeper drilling, a company spokesman indicates.

"We have developed the shallow fields and now must go to the deeper fields, even though the cost of drilling is greater," he says.

He adds, "Any time we can find a depleted gas field that has the right characteristics—not a lot of leakage—we'll certainly take a good close look at it because we'd like to use it."

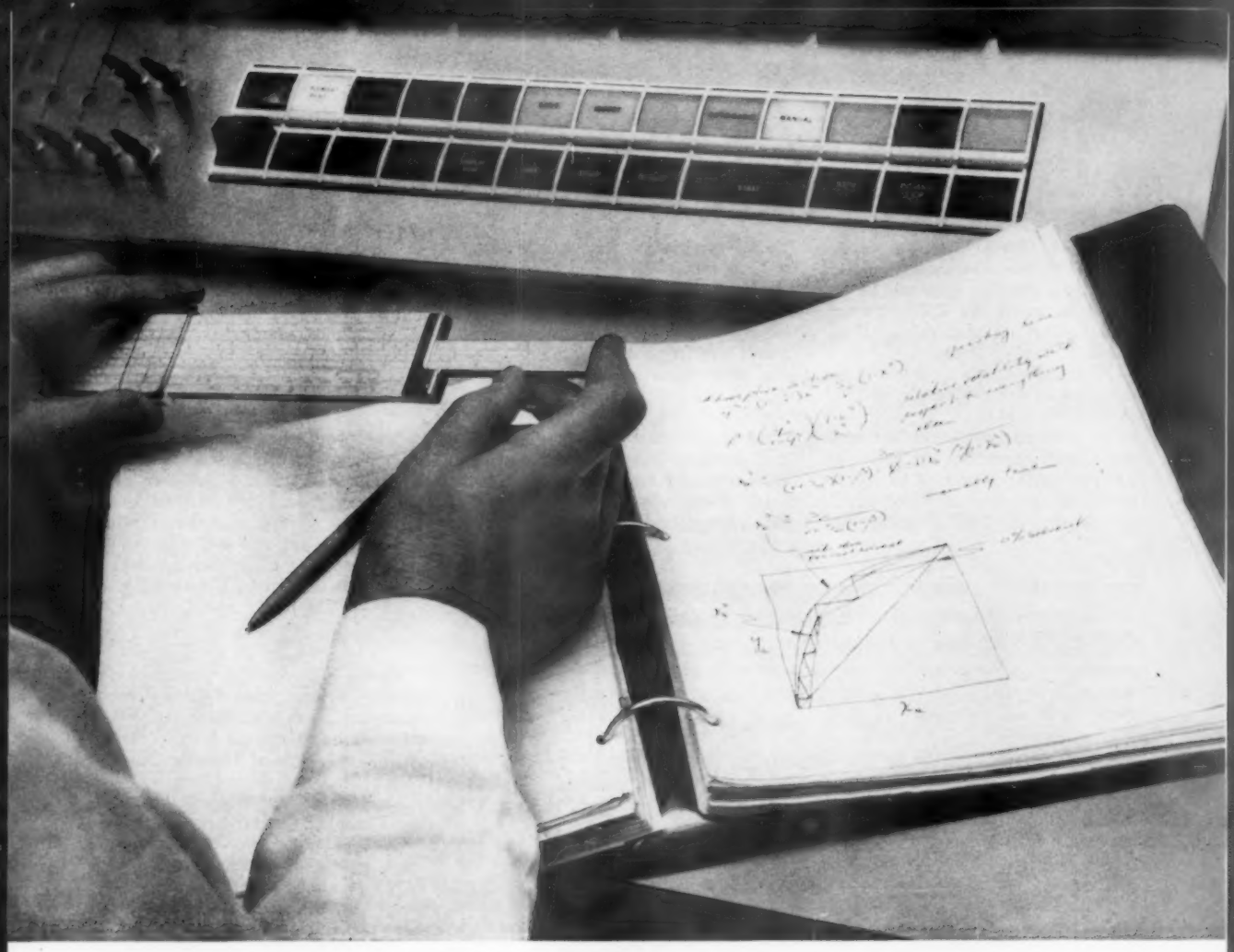
After it is filled, the Alden field will be capable of supplying the total winter gas needs of the company's Hutchinson-Superior system, which takes gas from a main line from Hugoton and delivers it to 27 communities.

PIPELINE 13 mi. long is built to link field and lateral serving many towns.

The system runs from Hutchinson, Kan. to Superior, Neb.

It estimates that peak-day deliveries through the system this winter will reach 55-million cf/d.

Main advantage of supplying the Hutchinson-Superior network from the field is that the main line then will be free to transport additional amounts of gas to points east of Hutchinson—including Kansas City, Independence, and Sedalia, Mo.



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The Unit Operations Simulator is available free of charge to all users of IBM 1620 Data Processing Systems. A basic 1620 rents for just $1,600 a month. Ask your local IBM representative to give you complete details on this versatile, low-cost engineering computer.

IBM's 1620 is a compact desk-size computer.

*Here's what the Unit Operations Simulator does for you: **1.** Computation of (equilibrium constant). **2.** Computation of (temperature) from a given equilibrium constant. **3.** Computation of enthalpy of a vapor and/or liquid stream. **4.** Find equilibrium constant nearest unity. **5.** Computation of temperature from a given enthalpy of a vapor and/or liquid stream. **6.** Bubble point and dew point calculations. **7.** Split one stream into two at specified ratio. **8.** Mix two streams of same phase. **9.** A mixed feed adiabatic flash calculation. **10.** Adiabatic flash. **11.** Isothermal flash. **12.** Flash to a specified quantity of vapor. **13.** Absorber/stripper calculation using Edmister short cut.

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What's New / IN PIPELINES, TANKERS, STORAGE

Northern Illinois Gas Co. is expanding its Troy Grove (Ill.) underground gas storage reservoir to enable it to boost the rate at which it can withdraw gas to meet expected increased demand.

The $1-million project involves the drilling of 21 wells to depths of from 1,200 ft. to 1,800 ft.

The additional wells could double Troy Grove's capacity, which is now 12-billion cu.ft., according to Northern Illinois.

With the additional capacity, the normal withdrawal rate will be hiked to 200-million cf/d, which could be increased to 300-million cf/d in emergencies. Last winter, Troy Grove supplied up to 100-million cf/d, and could have supplied 170-million cf/d had the need arisen.

•

A Federal Power Commission examiner's decision handed down last week denies interstate gas transmission companies the right to sell direct to industrial users, if there's a local distributor who can handle the sale.

The decision was reached by Examiner Robert M. Weston in rejecting a request of Southern Natural Gas Co. for permission to provide direct interruptible service to two Savannah (Ga.) companies.

Weston said it was the prerogative of FPC—not the transmission company itself—to decide who will handle industrial sales in a local area, and that in the Southern Natural case, there was a local distributor who could handle the sale and who would be subject to the jurisdiction of the state's Public Utilities Commission.

•

Authority to build a second crude pipeline system from Fiddler Creek to Lance Creek in northeastern Wyoming, is being sought by the Plains Pipeline Division of Franklin County Corp.

Crude from several pools in Crook and Campbell Counties is transported by Belle Fourche Pipeline Co. to an existing line of Plains from Fiddler Creek to Lance Creek, where it connects with the system of Service Pipe Line Co. But production in the pools is expected to rise to 35,000 b/d soon, while capacity of the present line is only 28,000 b/d.

•

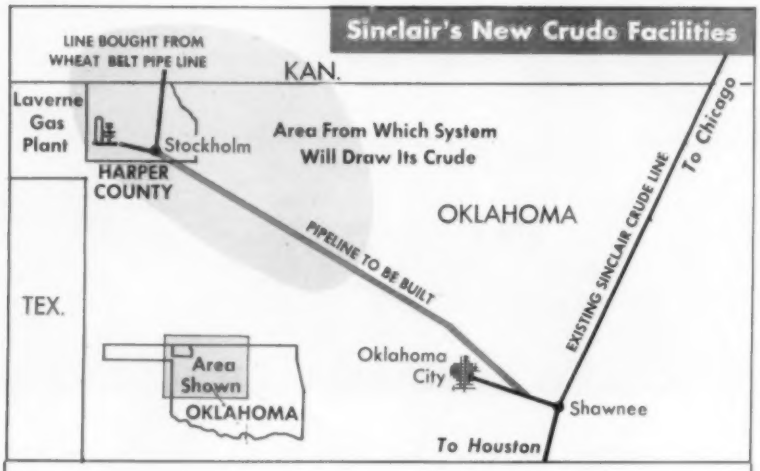
Phillips Petroleum Co. will take propane from the new LPG system that will be created by Northern Gas Products Co. and Great Lakes Pipe Line Co. (PW—Mar.17'60,p34).

P. A. Gass, Northern Gas president, says that Phillips has signed a contract to market the propane from the six terminals at Bushton, Kan.; Plattsmouth, Neb.; Des Moines, Mason City, and Iowa City, Iowa, Prophetstown, Ill.; and Rosemount, Minn.

•

The Federal Power Commission will hold a hearing on Apr. 10 on a plan of American Louisiana Pipe Line Co. to build an 8-in. line to connect Holly Ridge field, Tensas Parish, La., to its main gas transmission system.

American Louisiana estimates that dry recoverable reserves committed to it by five producers in the area total some 30-billion cu.ft.



New Outlet Planned for Anadarko Crude

Sinclair Pipe Line Co. is enlarging its crude pipeline system to provide a new outlet for crude and condensate from the northeastern part of the Anadarko Basin.

The project will include both new construction and the acquisition of existing facilities, at a total cost of from $6-million to $7-million.

The company will build a 168-mi. line from a line of Wheat Belt Pipe Line Co., in Harper County, Okla., which it has bought, to its main crude line at Shawnee (map).

The Wheat Belt line was owned by Cameron Crude Oil Corp., Tulsa.

In addition, Sinclair Pipe Line has purchased gathering systems in the area, and a gas processing plant at Laverne.

Crude and condensate will be moved by the gathering systems into the former Wheat Belt line and then through the new line to Sinclair's main system, which supply refineries at Wood River, Ill., Chicago, and Houston.

The new system will also move liquids from the gas processing plant to the main line.

Initial volume that will be carried by the system is estimated at 10,000 b/d, according to Earl W. Unruh, Sinclair Pipe Line's president. Unruh says that the new facilities will stimulate production in the northeastern part of the basin, where Sinclair Oil & Gas Co. has "considerable proven acreage."

The Market Trend

PETROLEUM WEEK

March 24, 1961

The More the People, the Freer the Price

Cram a lot of people into a country, and the chances are good that oil prices there are free to move up or down at will. This isn't a hard and fast rule, but it's uncannily right in many cases.

Conversely, pick a nation where the strain is thin, and the chances are that oil prices are severely regulated. This seems especially true in unfriendly terrains—in mountains, deserts, and jungles.

Try this theory for size on a few populous countries. The most notable example of free oil prices occurs in the U.S. (pop. 180-million). Prices also are free in Great Britain, Germany, and Japan, all of which are peopled about 500 to the square mile. In densely settled Ceylon, prices are free (although controls are threatened). Teeming Hong Kong is uncontrolled, too.

Now try some of the sparsely settled areas, with a lot of desert. In Australia, prices are government-regulated in two states, South Australia and Queensland, and the rest of the nation follows suit. In Morocco, prices are regulated each month by a formula of the Direction des Carburantes, in Paris. Lebanese prices are fixed by the government by a price formula for the Tripoli refinery. Devaluation of the riyal 15 months ago has failed as yet to budge a government price-fix in Saudi Arabia.

Next, let's move into the mountains. The most rigid government price control, probably, has been in Peru—in the Andes. In Colombia, it takes about two years to get a price change out from under the wheels of government. In Turkey, prices for gasoline, kerosine, and diesel fuel are set by the government for the three principal terminals at Istanbul, Iskenderun, and Izmir. In Norway, a Price Directorate checks import costs each month, and then names prices to consumers.

Bear with us while we check a couple of jungles. In Brazil's Amazonia, a complex government formula is used to arrive at oil prices. In Vietnam, strict controls set prices, and allow distributors a 10% markup. In Ecuador, all changes must be approved by the Ministry of Economy.

If exceptions prove the rule, here are the odd-balls. Prices in heavily settled Netherlands are strictly controlled. On the other hand, prices in rugged Sweden are free.

Gulf Cargoes Off: Gulf Coast cargo prices for light fuel oils slipped last week, signaling the end of winter. No. 2 fuel was off 0.25¢ to 9.25¢, and not strong at the new level. Kerosine dropped 0.375¢ to 9.875¢.

Room for All? Note that several new chartering broker firms have sprung up in New York recently. It wouldn't look like a time for new ships brokers, for tanker rates are low, and will continue so for a long time.

The Market Place

AROUND THE WORLD

Current key crude and product prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service, a McGraw-Hill Publication.

All prices as of March 20

Bold face type indicates changes from previous week

KEY PRICES—REFINED PRODUCTS

(¢ per gal. except dollars per bbl. where $ is shown)

Western Hemisphere

U.S. Gulf Coast, cargoes
- **Gasoline, 98 oct prem** ..... **11.75↓-13.25**
- **Gasoline, 92 oct reg** ..... **10.75↓-11.5**
- **Kerosine** ..... **9.875↓-10.75**
- **Heating oil, No. 2** ..... **9.25↓-10**
- **Gas oil, 48-52, d.i.** ..... **9.5↓-9.75**
- Fuel oil, bunker "C" $2.30-2.40

Caribbean, cargoes
- Avgas, Grade 100/130 ..... 14.75
- Gasoline, 93 oct research prem 10.875
- Gasoline, 87 oct research reg 9.5
- Gasoline, 80 oct research 8.75
- Gasoline, 70-72 oct motor method 8.625
- Kerosine 9.875
- Heating oil, No. 2 ..... 8.625
- Gas oil, 48-52 d.i. 8.875
- Fuel oil, bunker "C" $2.00

New York Harbor, barges
- Kerosine 11.45-11.9
- Heating oil, No. 2 ..... 10.45-10.9
- Fuel oil, No. 6 ..... $2.62

Okla.-Group 3, northern shpt., bulk
- Gasoline, 91 oct reg 12.5-13.25
- **Kerosine** ..... **10.375↓-11**
- **Heating oil, No. 2** ..... **9↓-9.75**
- Fuel oil, No. 6 ..... $1.80-1.90

Chicago, bulk
- **Gasoline, 92 oct reg** ..... **12↓-12.375↓**
- **Heating oil, No. 2** ..... **9.75↓-11.85**
- Fuel oil, No. 6 high sulfur 7.65

Los Angeles, rack
- Gasoline, 88 oct reg 11-12.65
- Diesel fuel, PS 200 ..... 7.75-11.25
- Light fuel, PS 300 ..... $2.90
- Heavy fuel, PS 400 ..... $2.10-2.45

Natural Gasoline, Grade 26-70
- FOB Group 3 ..... 4.5
- FOB Breckenridge, Tex. 4

LP-Gas
- Propane, Oklahoma (Group 3) 4.5-5
- Propane, Baton Rouge 5.875

Pennsylvania Lubes
- Bright stock, 25 p.t. 26
- 200 vis. neutral, 25 p.t. 28

Mid-Continent Lubes, Tulsa basis
- Bright stock, solvent, 95 v.i. 26-27
- Neutral solvent, 200-210 vis. 23-24

Gulf Coast Lubes
- Bright stock, solvent, 95 v.i. 26-27
- Neutral, solvent, 200 vis. 23-24

Eastern Hemisphere

Singapore (Pulau Bukom) cargoes
- Avgas, grade 100/130 ..... 15.5
- Gasoline, 79 oct research 9
- Kerosine 9.75
- Gas oil, 48 d.i. minimum 9

KEY PRICES—CRUDE OIL

(2¢ differential per deg. of grav. applies except as noted)

Western Hemisphere

United States (at the well)
- Mid-Continent, (Okla.-Kan.), 36.0-36.9 ..... $2.69-2.97
- North Dakota, 36.0-36.9 ..... 2.47-2.87
- Texas:
  - Gulf Coast, low cold test, 26.0-26.9 ..... 3.50
  - Gulf Coast, Upper & Lower, 26.0-26.9 ..... 2.92-3.22
  - West Texas, sweet, 36.0-36.9 ..... 3.00
  - West Texas, N.M., inter., 36.0-36.9 ..... 2.93
  - West Texas, N.M., sour, 32.0-32.9 ..... 2.71
  - East Texas, flat 3.05-3.25
  - Mirando, 28.0-28.9 ..... 2.96-3.31
- Illinois Basin, flat 3.00
- Pennsylvania Grade, Bradford dist., flat 4.80
- California, Signal Hill, 21.0-21.9 ..... 2.33†
- North Louisiana-Arkansas, 36.0-36.9 ..... 2.72-3.02
- Wyoming, sweet, 36.0-36.9 ..... 2.85-2.90
- Wyoming, sour, 32.0-32.9 ..... 2.63-2.71

Canada (flat prices, at the well)
- Pembina (Alta.) $2.38
- Leduc-Woodbend (Alta.) 2.53
- Redwater (Alta.) 2.42
- Steelman A (Sask.) 2.425
- Virden (Man.) 2.285

Venezuela (Cargoes, FOB lifting port designated)
- San Joaquin, 41.0-41.9, Puerto la Cruz $3.10
- Oficina, 35.0-35.9, Puerto la Cruz 2.80
- Tia Juana, Medium, 26.0-26.9, Amuay 2.30
- Bachaquero, flat, La Salina 1.85
- Lagomar, 31.0-31.9, Cardon 2.55
- Lagunillas Heavy, flat, La Salina 2.07

†Differential per deg. of grav. varies

Eastern Hemisphere

Middle East, Persian Gulf (Cargoes, FOB lifting port)
- Arabia, 34.0-34.9, Ras Tanura $1.80
- Safaniya, 27.0-27.9, Ras Tanura 1.47
- Iran, 34.0-34.9, Bandar Mashur 1.78
- Iran, 34.0-34.9, Abadan 1.73
- Iraq, 35.0-35.9, Fao 1.72
- Kuwait, 31.0-31.9, Mina-al-Ahmadi 1.59
- Qatar, 41.0-41.9, Umm Said 1.95
- N. Zone, Burghan, 23.5-24.4, Mina Saud 1.48
- N. Zone, Ratawi, 23.5-24.4, Mina Saud 1.41
- N. Zone, Eocene, 16.5-17.4, Mina Saud 1.28

Middle East, Eastern Mediterranean
- Arabia, 34.0-34.9, Sidon $2.17
- Iraq, 36.0-36.9, Tripoli, Banias 2.21

North Africa, Phillipeville, Algeria
- Hassi Messaoud, 48 and above $2.65

KEY TANKER RATES

(Last paid, per long ton, single voyage)

- U.S. Gulf-New York, clean ..... (ATRS flat) $2.85
- U.S. Gulf-New York, dirty ..... (ATRS+10%) $3.14
- **NWI-USNH, dirty ..... (ATRS—62½%) $1.04↓**
- **NWI-UK/Cont., dirty ..... (Scale—60%) 13/1*†**
- Persian Gulf-UK/Cont., dirty ..... (Scale—50%) 30/9*
- Persian Gulf-USNH, dirty ..... (USMC—65%) $4.45

**Sterling*

As fuels and as chemical components . . .

Natural Gas Liquids Continue to Grow

Natural gas liquids (NGL) are assuming an increasingly important position, both as power-generating fuels and as chemical components.

That conclusion can be drawn from a forum on natural gas liquids at the recent convention of the Natural Gasoline Assn. of America, in Dallas.

D. S. Warning, director of marketing research of American Oil Co.; C. H. Kollenberg, of Humble Oil & Refining Co.; and Dr. Howard C. Malakoff, of Cities Service Research & Development Co., presented reports on the future of NGL in various fields.

One of the main reasons for the recent rapid development of NGL is that their sale is not regulated by the Federal Power Commission, said Warning.

Today, natural gas liquids bring the producer considerably more return, per unit of energy, than does natural gas.

For this reason, 90% of the liquids, are taken out of natural gas streams today before the gas reaches the distributing utility.

In 1959, an average of 1.47 gal. of NGL were taken out of every thousand cu. ft. of processed natural gas in the country. And liquid content of as little as 0.6 gal. per 1,000 cu. ft. can be recovered economically (PW—Feb.7'61,p63).

These figures do not include the LPG supplied from refineries, which amounts to about one-fifth of the total LPG supply, Warning said.

Domestic and commercial use of LPG as fuel, by far the largest single application for these products, has grown at a rate of 9.3% per year over the decade.

Chemical use, which is the second largest use, grew at 17% per year. Other major uses include: internal combustion engine fuel, which grew at a 9.6% rate per year; raw material for synthetic rubber, 8.6% per year; other industrial applications, 8.4% per year. The use of LPG as refinery fuel will no doubt decline, Warning predicted, in view of its greater value for other applications.

Several basic problems are currently being solved, now that the NGL industry is coming of age. The most important is one of distribution.

Demand is now large enough to justify the construction of pipelines expressly for LPG transportation (PW—Feb.17'61,p34), to supplement the present transportation of LPG through crude and finished products pipelines.

The first LPG pipeline, already in operation, is the 2,200-mi. system of the Mid-American Pipeline Co. Its initial throughput is 40,000 b/d, its projected throughput 85,000 b/d.

At least three other LPG pipelines are now under construction: one by Transcontinental Gas Pipeline Co.; one by Dixie Pipeline Co.; and one by Great Lakes Pipe Line Co.

A second important problem receiving attention today is that of adequate storage. Underground storage of LPG is being actively developed.

Huge storage caverns in both producing and consuming areas help to stabilize the LPG market (PW—Aug. 26'60,p34).

The refining industry remains the largest consumer of natural gas liquids: It takes nearly one-half of total production, Kollenberg said.

For the past decade, he said, the rate of increased utilization of NGL in refineries has been greater than the growth of gasoline production. In 1960, gasoline contained as much as 10.9% of NGL, primarily normal butane and natural gasoline.

The importance of NGL in refineries for the control of gasoline sensitivity is growing steadily.

The trend is towards higher motor-octane rating of gasoline, and lower sensitivity (the difference between the motor and the research octane ratings).

Today, octane quality is being improved, and sensitivity lowered, by blending into the gasoline pool:

- Alkylate. Alkylation requires isobutane, which can be made from normal butane, a natural gas liquid.
- Isopentane, an NGL fraction.

The importance of NGL for the improvement of gasolines in refineries may be adversely affected by the advent of hydrocracking. But it isn't likely that any influence on NGL demand on that score will be detected before 1965, Kollenberg said.

The hydrocracking process produces a saturated naphtha, which is usually reformed before inclusion in the gasoline pool; it also produces a significant volume of n-butane.

Thus, hydrocracking would diminish the sensitivity problem, and would affect the demand for NGL on two scores: no need for alkylation, and ample production of butane. But only 30,000 b/d of hydrocracking capacity has been announced for completion by 1962, Kollenberg pointed out.

The rapid growth of the petrochemical industry will greatly increase the demand for natural gas liquids.

Dr. Malakoff described the growing impact of the petrochemical demand upon the use of NGL. Not only will demand for propane and butane be directly affected, but natural gasoline components will be depended upon, in refineries, to supplement other components necessary for chemical conversions, particularly in the field of aromatics.

Secondary recovery in oilfields has also become a market for LPG in the past few years, and it is growing.

It's hard to say whether miscible phase recovery of crude oil, which involves injection of LPG into sluggish reservoirs, is really a "use" of LPG. Warning remarked, since the liquids, in all likelihood, eventually come on the market again.

Better Butyls by Bromination

Certain inherent deficiencies of butyl rubber can be significantly reduced by bromination, according to B. F. Goodrich Chemical Co.

The copolymer of isobutylene and isoprene known as butyl rubber has a few undesirable characteristics, such as a slow cure rate, difficulty in obtaining adhesion to other rubbers or metals, and unsatisfactory results when it is blended with other polymers.

At the recent meeting of the American Institute of Chemical Engineers, Goodrich's Carl H. Lufter reported that these deficiencies can be traced to a few unsaturated linkages

found in the butyl polymer molecule.

Halogenation—preferably with bromine—reduces substantially this small unsaturation. The reaction is mainly one of addition (diagram). But, Lufter said, it is suspected that a substitution reaction also comes into play in certain portions of the copolymer molecule.

Only a small amount of bromine is required, Lufter said. It is in the range of 1% to 3.5% by weight.

Actually, this bromination process is very similar in its effects to that of the chlorination of butyl rubber performed by Enjay Chemical Co. (PW—Dec.23'60,p28).

Bromination substantially increases the cure rate of butyl rubber and reduces the quantity of cure accelerator required.

In addition, brominated butyl can be blended with other polymers to obtain such desirable properties as resistance to ozone, chemicals, and heat.

The good adhesive tendencies of brominated butyl towards natural and synthetic rubbers make it a desirable material for the preparation of an adhesive cement for retreads and tire liners.

The retreads or the liners, Lufter indicated, can be made either of regular butyl, or of blends of butyl and brominated butyl, because of the good impermeability of butyl to air. But a layer of brominated butyl cement should be applied before the curing operation, to make the retread, or the liner, adhere solidly to the tire carcass.

Brominated butyl rubber has many potential applications in the industrial field, said Lufter. Among them are motor mounts, jacketing for steam hose, gaskets, and conveyor belts.

Large Motor Raises Problems

The trend toward larger, higher-capacity process units in refineries calls for the use of large-size electric motors. Improvements in electrical equipment and in power system design have made these motors highly reliable today.

As an example of a really large electric motor drive, K. R. Sheetz, of American Oil Co., Whiting, Ind., this week described the installation and the first year of operation of an 11,000-hp. motor, driving the air compressor of the fluid catalytic cracking unit at the company's Wood River (Ill.) refinery.

Sheetz spoke at the 23rd annual American Power Conference of the American Society of Mechanical Engineers, in Chicago.

These large motors pose certain problems, which call for special arrangements with the local electric utility company.

The 11,000-hp., 1,200-rpm. G.E. synchronous motor operates on 13,200 volts (3-phase, 60-cycle).

As this motor alone would take about 70% of all the current generated by the refinery power plant, it is never operated on refinery-generated current.

The current generated by the refinery, and the current supplied by the electric utility company operate in parallel on all other refinery equipment. In winter most of the load (except the big motor) is carried by the refinery power plant; the two main processing units, in particular, take the greatest portion of this current, at 4,160 volts. In summer, however, it is more economical for the refinery to let the utility company carry most of the load.

At all times, special precautions must be observed to assure continuity of operation.

The fluid cat cracker is one of two semi-integrated units designed to operate two years between turnarounds. This means that the motor must operate with an absolute minimum of downtime and outages. The other process unit on such a schedule is the crude still.

The 11,000-hp. motor can be started on a utility preferred line without adverse effects to other users on the network; it causes a 10% drop on the utility substation bus.

An automatic transfer switch, set to operate 45 seconds after an accidental outage on the utility preferred line, transfers the load to a second utility line, an emergency line, which can also carry power generated in the refinery.

When this occurs, steam is automatically admitted to the cat cracking unit to prevent catalyst plugging. This continues for five minutes, to give the operators time to restart the motor and resume operations.

But this is not necessary when the preferred utility line is restored to service, because then the preferred line and the emergency line are operated for a while in parallel; then the switch to full preferred-line operation causes no interruption.

If the utility power should fail on both preferred and emergency lines, the large motor would have to be stopped, and the two parallel systems, one fed by the utility and one by the refinery, would have to be immediately separated.

This would entail a stoppage of the cat cracker.

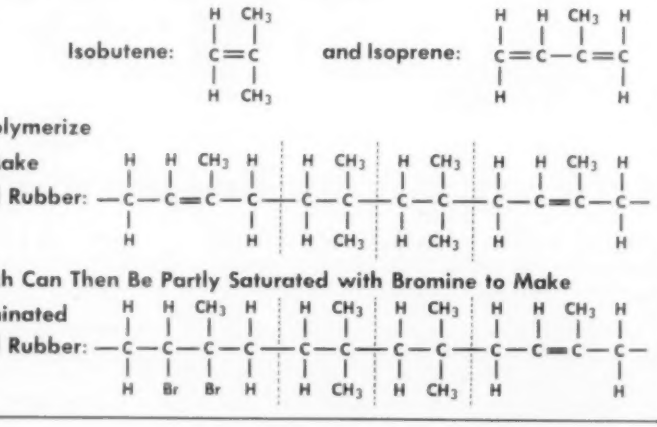
In such a case, the refinery-generated current would have to carry the balance of the refinery load. Several nonessential items would be automatically stopped, so that the refinery generators could supply enough power for the essential units.

So far such a failure has never occurred, said Sheetz.

For the design of the complex combination system of utility and refinery power networks, where such large motors are involved, a network analyzer study is of great value.

A network analyzer is a mathematical model of the system, which is fed to an analog or a digital computer. Every possible change and incident in electric power distribution can be simulated on this model, and the computer figures out the resultant

What Goes Into Brominated Butyl Rubber



16 lb. bowling ball doesn't impress concrete floor coated with NEW GLID-CRETE

New GLID-CRETE, a catalyzed epoxy resin, used to patch or resurface floors is six times more impact resistant than concrete.

Proof—a 16 lb. bowling ball was dropped from 6 ft. on a 3″ slab of bare concrete and on 2¼″ of concrete coated with ¼″ of GLID-CRETE. The concrete split, chipped and cracked. Concrete coated with GLID-CRETE was smooth as new, not a dent.

Easy to apply with spray or trowel, GLID-CRETE is highly resistant to most of the chemicals used in processing plants. It offers many outstanding advantages in the maintenance, repair and construction of masonry floors and structures.

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loading, bus voltages, and transient stability. This study makes it possible to predict every potential source of trouble, and to select the proper relays and settings to make the system stable and reliable.

At the Wood River refinery, Sheetz told PETROLEUM WEEK, General Electric Co., Schenectady, N.Y., performed the network analyzer study with its own computer.

The study brought out that under various fault conditions on the refinery system, no difficulty would be experienced with the 11,000-hp. motor, but the faults had to be cleared very fast to avoid refinery instability. Very fast, Sheetz pointed out, means about ¼ second, or about 15 cycles. The relay settings on the refinery feeder were adjusted to insure such rapid cleaning of faults.

Operating experience, Sheetz said, emphasized the value of a network analyzer study: The Wood River motor has now been operating continuously since June, 1960, without an interruption.

Will an Alaska Refinery Pay Off?

A small refinery in Alaska might be an economic proposition: Light products would be consumed locally, and residual fuel oil exported to the Japanese market.

That is the conclusion of a team of scientists, engineers, and businessmen from Arthur D. Little, Inc., in reply to a request by the State Government of Alaska for assistance in identifying resources in the new state which would be of interest to investment groups.

A. D. Little presented its conclusions at a recent meeting in Tokyo of Japanese companies likely to be interested in providing the Japanese outlet necessary for such a development.

Good crude oil is available locally in Alaska, but refined petroleum products are costly.

Swanson River and Soldotna Creek crudes could be used alternately or in combination in a proposed refinery, the Little report said. These crudes are of good quality, with a low sulfur content, and offer no difficulty from the refiner's standpoint. Substantial additional drilling is contemplated in the Swanson River area for 1961 (PW—Feb.3'61,p22).

Freight charges of from $1.27 to $1.51 per bbl. from the Gulf Coast to Seward make finished imported petroleum products very costly in Alaska.

It is expected that the 1965 consumption of petroleum products in Alaska will reach 5¾-million bbl., of which 3.2-million bbl. will be used within the Anchorage-Fairbanks market area.

And Japan, which must import a portion of its residual fuel oil, would be the logical market for Alaska's heavy refinery products, which have no market locally.

The Economic Planning Board of Japan predicts that by 1970 Japan will use over 250-million bbl. of heavy fuel oil, of which over 90-million might have to be imported, depending on Japanese refinery operations.

Alaskan low-sulfur fuel oil delivered to Japan at prices competitive with recent Russian deliveries would have to be priced at the refinery at a maximum of $1.86 per bbl.

Based on this price, and light product prices competitive with the price of large-volume bulk movements from the U.S. Gulf, a skimming and cat reforming refinery in Alaska would be an attractive investment.

A 17,500 b/d refinery processing 30-gravity, low-sulfur Swanson River crude, could bring a return of 7% on the investment, and a payout in 7.6 years, Little predicts.

The investment needed for such a refinery is estimated at $21 million—$1,200 per b/d—and operating costs are assumed at 50¢ per bbl. Based on U.S. Bureau of Mines data, the refinery would yield 21.5% of gasoline, 19.4% of jet fuel and distillates, and 53.1% of residual fuel oil for export.

The discovery of large reserves of natural gas in the Kenai Peninsula has opened the possibility of shipping this fuel in refrigerated tankers to Japan.

A liquefaction plant with a capacity of 36.5-billion cu. ft. per year would cost about $55-million, ADL estimates. Three 15,000-ton methane tankers built in Japan, would cost $35-million, and a receiving and regasification plant in Japan would cost $15-million, a total investment—including working capital—of approximately $110-million.

Annual operating costs would total $16-million, or 44¢ per Mcf.

If a sales price of gas, in Japan, of $1 per Mcf. can be assumed, the rate of return on the investment would be 6.4%, and the payout rate 8.3 years.

Army Evaluates Gas Turbines

The U.S. Army foresees a wide application of gas turbines in its equipment, as soon as their fuel consumption as well as their present high initial cost can be reduced.

At the sixth annual gas turbine conference, in Washington, Brig. General George W. Power, director of development, Office of the Chief of Research & Development, Dept. of the Army, predicted:

"It is almost a certainty that the gas turbine will eventually replace diesels in some Army applications"—although the Army is at present going through a stage of intensive dieselization for its equipment.

Gen. Powers reviewed the work which the three corps responsible for the development of Army engines were carrying on with gas turbines.

The Corps of Engineers, which devotes its efforts to industrial engines, is currently studying the application of gas turbines to ground support of guided missiles. A whole family of gas turbine generators, ranging from 7½ to 60 kw. will be studied this year, Gen. Power said.

Army Ordnance, although now in the process of dieselizing its automotive equipment, has an active program for gas turbine applications in the automotive field.

Its program covers six major areas:

(1) Procurement of commercial gas turbines for vehicle tests. Five of these are of current interest now.

(2) Evaluation of combinations of turbines and reciprocating engines.

(3) Use of turbines as "cold starting kits," to be tested in Alaska.

(4) Integration of turbine and transmission in a single compact unit for combat vehicles.

(5) Joint development with the Navy of an efficient 600-hp. turbine for use in a battle tank.

(6) Evaluation of a 300-hp. gas turbine power package, including the turbine and its power train.

And the Transportation Corps is pursuing the work it started several years ago for the development of a series of lower-horsepower gas turbines for use in Army aircraft.

Concurrent with these engine programs, the Army is developing a series of aircraft, both fixed-wing and helicopters, designed specifically for turbine engines. "The Army," Gen. Power said, "is essentially committed to gas turbines for the foreseeable future in its aircraft."

What's New / IN PROCESSING

Motor oils giving 50% longer service than present commercial oils have been produced by a process called thermal diffusion, H. E. Alford, Standard Oil Co. (Ohio), told the American Chemical Society last week.

The process, developed by Sohio, separates the molecules of oil according to their shapes; the molecules with superior lubricating ability are then concentrated (PW—Oct.14'60,p40).

In laboratory tests, the new oils showed only small changes in their flow properties at the extremes of auto operations, Sohio reports, and did not thin out at high temperatures or thicken at low temperatures.

•

Motor vehicles operated by the petroleum industry in Los Angeles County are being equipped with devices to aid in the fight against smog, reports Felix Chappellet, vice-president and general manager of the Western Oil & Gas Assn. The device, not yet required by law, carries fumes from the crankcase back to the cylinders, where they are burned rather than emitted to the atmosphere.

•

Sunland Refining Corp., Fresno, Calif., may buy Fletcher Oil Corp., Wilmington. Sunland holds an option to buy, but to date the company hasn't come to any decision on exercising it. Fletcher operates a refinery in Torrance, Calif., and markets in Oregon, Washington, and California. Sunland has a refinery in Bakersfield.

•

Several new polypropylene products have been developed recently: Enjay Chemical Co. will market a polypropylene capable of resisting elevated temperatures for extended periods, called Escon 125, and Avisun Corp. has two new food-grade polymer, 4011 and 4014, and a polymer for high-flow injection molding uses.

•

The total cost of chemical facilities completed in 1960, under construction by the turn of the year, and planned for construction in 1961, exceeds $3.5-billion, according to data released by the Manufacturing Chemists Assn. in its recent annual construction survey.

The largest proportion by far of this construction is for materials of petrochemical origin. Among them are (figures in millions of dollars):

Organic chemicals	$1,262
Plastics and Resins	566
Fertilizers	225
Synthetic fibers	217
Rubber	100

To these figures must be added those categories which have little or no relation to petrochemicals (in millions of dollars):

Inorganic chemicals	$650
Laboratories	237
Metals	62
Miscellaneous	232

•

The visible supply of platinum in the world is severely limited, despite its indestructibility and the possibility of re-using it over and over. The oil and petrochemical industry accounts for one-third of the domestic demand for platinum.

Platinum consumption in the U.S. is about 350,000 ounces per year, of which 60,000 ounces are reclaimed, mostly from spent catalyst, according to Geo Surveys, Washington, D.C.

For the U.S., the most dependable source of supply is Canada, Geo Surveys indicates, and International Nickel Co. is the chief producer.

Platinum and other precious metals are actually by-products for INC and the quantity available depends on the yearly demand for nickel and copper.

Platinum's price has become stabilized at $82 to $85 an ounce.

•

Rubberized asphalt tested on over 400 mi. of highway on the West Coast appears to have increased toughness, better retention of stones in the mix, less brittleness, and freedom from bleeding, H. E. Endres, Goodyear Tire & Rubber Co., told California's recent annual highway conference.

The test was conducted in Kings County, Wash., over a period of several years. The rubberized asphalt mixture was prepared by Union Oil Co. of California at a special blending plant at Edmonds, Wash.

What's new IN CAT CRACKING

A new 24-hour emergency service system, already proven foolproof, has been made available to the oil and gas industry by the Petroleum Chemicals Department, Davison Division of W. R. Grace & Company.

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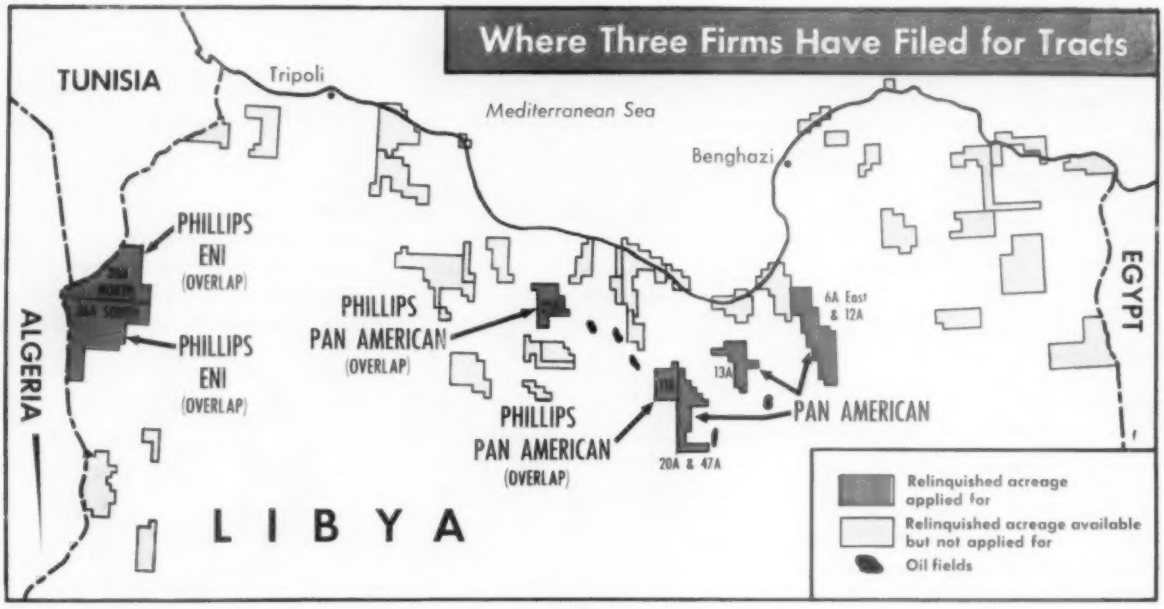


Only Three Firms File for Libya Acreage

"Libya is not looking very interesting any more—except for the geology," said one U.S. oil man last week. He wasn't alone in his opinion.

The statement was startling, especially in light of the intensity with which Libyan oil exploration has been pushed in recent years—to a large extent by U.S. oil companies.

In the North African kingdom, the existence of three commercial oil fields has been definitely established, and significant discoveries give promise of more to come.

So why the waning interest?

The terms and conditions are getting tougher in Libya, and some oil men feel Libya may be pricing itself out of the market for oil exploration.

With a basically favorable 50-50 oil law, Libya has already attracted 17 oil firms to its deserts and tidal waters. These companies have drilled more than 200 holes in five years.

But since the first major oil discoveries were made in 1959, Libya's Petroleum Commission has been asking potential applicants for terms over and above the minimums set by the oil law—and getting them.

The grumblings were amplified last week when Libya accepted new acreage applications from three firms under circumstances that puzzled many oil companies.

On Mar. 6, the Petroleum Commission opened reserve acreage—tracts returned to it by companies presently operating in Libya in conformity with the oil law's relinquishment requirement (PW—Mar.17'61, p6).

Pan American International, Phillips Petroleum, and the Italian state-owned ENI group filed applications for seven permits. On four of them, there were overlapping applications (map).

Phillips has applied for four tracts, on all of which overlapping bids were also filed—two by ENI and the other two by Pan American.

Pan American, in addition, has applications in for three blocks on which there are no overlaps.

According to regulations set down by the Petroleum Commission, applicants may secure a maximum of four tracts, totaling 15,000 sq.km.

What surprised and puzzled many oil companies waiting a chance to apply for acreage was the quick and unexpected deadline for applications —one week from the opening date.

Several firms said they had no warning that applications for acreage would be required so soon. Some reported they had no indication when the filing would be closed until after the Mar. 13 deadline.

The reason for the commission's action in setting such a quick deadline was obscure. It said the reserve tracts would be offered again, but gave no date.

Phillips is the only one of the three applicants that qualifies as a "newcomer" to Libya. The others already hold exploration tracts.

Not that Phillips didn't try previously. It filed a bid on a large tract in south-central Libya, only to lose out to the Italian private firm Ausonia Mineraria. In an attempt to secure some 10,500 sq.mi. of offshore acreage, Phillips was loser to Atlantic Refining Co.

Pan American holds rights to four tracts measuring some 31,000 sq.mi. Cori, ENI's Libyan affiliate, has one block totaling 10,500 sq.mi.

There were no details available on the nature of the terms any of the applicants offered. But past history and the announced intentions of the Petroleum Commission give some hints.

The commission's chairman, Mohammed Asscifat, told PETROLEUM WEEK (PW—Jan.20'61,p18) that Libya expected applicants to give up the 25% depletion allowance provided for by the oil law.

Atlantic Refining waived depletion to secure its four offshore tracts last

year. And in 1959, ENI gave up the allowance in its successful bid for a tract. In addition, it offered Libya an option for a 30% interest in the producing company once oil in commercial quantities was found. It also agreed to pay a 17% royalty, instead of the 12½% set by the oil law.

At the same time, ENI bound itself to give similar terms for any future oil rights.

Despite the unexpected deadline and a slackening interest, there was some surprise expressed in U.S. circles that no more than three firms did apply for acreage.

It was pointed out also that the applications covered only about 20% of the acreage made available by the recent spate of relinquishments, though some of this total was thought to have been ruled out by geological considerations.

The paucity of applicants is even stranger considering the long list of firms that have indicated an interest in securing their first Libyan oil rights.

The list includes such companies as Sinclair, Cities Service, Superior, Kerr-McGee, Champlin Oil & Refining, and Signal.

In addition, six U.S. firms have formed a joint venture to seek acreage. The companies and their interests in the venture are Sun, Union, Pure, and Tidewater (20% each), and Ashland and Skelly (10% each).

Two other groups of companies have also been formed to seek Libyan acreage. One is Libya-Texas Petroleum & Refining Co., composed of Clark Oil & Gas Co., Dallas, and an unidentified Houston independent.

The other is Libya Desert Oil Co., which includes Kewanee Oil & Gas Co., Tulsa; the D. D. Feldman interests of Dallas; and the Cooperative Refinery Association of Kansas City.

Venezuela's Aim Now: Better Prices

CARACAS—President Romulo Betancourt says the government can only get more income from oil through recovery of world prices—and not greater taxes—now that its share of industry profits has reached some 69%.

"Having reached the present level of participation in oil profits, greater benefits cannot be obtained from oil through new or increased taxes," he said in his annual report to Congress last week. For this reason, he added, Venezuelan government oil policy now aims at recovery of world oil prices.

Oil company profits in Venezuela dropped 11% in 1960 to an estimated $358.8-million, from $398.5-million in 1959, the president said.

(The figures were given by Betancourt in Bolivares; they have been converted at the official exchange rate of 3.35 to $1. The 1959 figure apparently reflects final statistics.

The president said the annual rate of return on average net oil company investment dropped to 11% for 1960, compared with 13% in 1959.

Despite payroll cutbacks, the oil industry's labor costs rose 13% in 1960 to $353.1-million, from $312.8-million in 1959.

According to latest estimates, Betancourt said, the 1960 government-company ratio of oil earnings was nearly 69-31, compared with 67-33 in 1959.

Government oil revenues were off slightly from the $812.5-million of 1959. Though Betancourt did not give a specific 1960 figure, it apparently will amount to approximately $797.9-million, calculated from the figure he gave for oil company profits, on the basis of the 69-31 split.

Betancourt told Congress that a decline in Venezuelan oil prices had been halted last year by the Oil Ministry's Coordinating Commission—which, he said, had been able to increase prices 5¢ a bbl. by the end of 1960.

Betancourt ascribed low oil prices to "the enormous pressure of the multiple interests of the great consuming countries."

Betancourt refuted the idea that a decline in crude prices was "for the purpose of prejudicing the producing countries" in which oil companies operate.

Such a view, he declared, is "partly due to ignorance—and sometimes was the purpose of imputing fraudulent maneuvers to the companies established in Venezuela."

Philippine Oil Bill Is Rapped

A Philippine oil bill that would hand all market growth since 1957 to a new locally controlled company in which Gulf Oil has a 25% interest was rapped both at home and abroad as "discriminatory" last week.

The bill, on which public hearings are being held in Manila, was introduced into the Philippine senate through 11 of its 24 senators.

One of its stated aims is "to enable Filipino enterprises to assume eventual control over the vital economic activity of importing, refining, and distributing crude and products and protect them against destructive competition."

The means proposed: to cut back four established marketers to their 1957 volumes of business and freeze them there.

In New York, Stanvac and Caltex expressed strong concern over the bill, which Stanvac president H. F. Prioleau said would be "harmful to the economy" of the Philippines "and to Philippine-American relations in general."

Prioleau warned that the proposed discriminatory action against a major industry that has made large capital investments is "bound to discourage other industries interested in the Philippines." The bill, he said, would mean a "serious reduction" of free competition, "and eventually an end to the benefits that such competition brings to the Philippine consumer."

A Caltex statement, calling the bill "unnecessary," also said it is "not in the best interest" of the Philippines.

In Washington, the State Department was studying the bill as a possible violation of a trade treaty under which the Philippines guarantees U.S. companies doing business in that country treatment equal to that given locally owned companies.

Shell—which now has Philippine partners holding a 25% interest in its refining-marketing companies—called the bill "unfair" at hearings in Manila before a senate committee.

The president of Shell's Philippine companies, which are preparing to build a 29,000 b/d refinery, said the bill was "unnecessary" to protect a company which, with the support of Gulf Oil, could certainly compete on even terms without such legislation.

And in Manila, the local press almost unanimously attacked the bill as "monopolistic," harmful to the coun-

try, counter to the government's other moves toward decontrol, and discriminatory—against one group of Filipino investors in favor of another. "This is not a case of Filipino First," said one columnist, "but choice Filipinos only."

The proposed cutback of established marketers to their 1957 sales volumes would hit Tidewater as well as Caltex, Stanvac, and Shell, the major suppliers who all have substantial long-time investments in the country.

Until last year, these four companies were the only marketers in the Philippines, with Caltex, Stanvac, and Shell each supplying slightly under one-third of product demand. Tidewater, which has a supply contract with Caltex, had a minor share—approximately 4% in 1957.

Consumption of all products in 1957 totaled 15.4-million bbl. and has risen 17% since then. This year it's expected to reach 20-million bbl., a 30% gain over 1957.

Until recently, Caltex's 24,500 b/d refinery was the only one in the country. Stanvac is about to dedicate a brand-new 25,000 b/d plant, and the 29,000 b/d Shell-Filipino unit is slated for completion next year.

The controversial bill would earmark the estimated 30% 1957-61 market increase—plus a monopoly on future growth—for Filoil Corp., a refining-marketing company that will complete a 17,000 b/d refinery next year.

Filoil has already completed a sizable number of service stations but is just getting started in marketing. In 1960, it supplied approximately 2% of demand for all products, which totaled 18-million bbl.

Filoil was formed in 1958-59 by Filipino investors with Gulf as a 25% participant and projected crude supplier. Gulf Oil, citing its minority interest in Filoil, last week declined any comment on the bill.

IRAN'S ABADAN REFINERY, the world's biggest, has capacity of over 500,000 b/d.

Iran Observes a Tenth Anniversary

Iran this week is observing a dramatic period in its 53-year oil history: the tenth anniversary of the creation of National Iranian Oil Co. to own all oil rights and the 505,000 b/d Abadan refinery (picture), still world's biggest.

NIOC is officially celebrating its tenth birthday at the beginning of spring, though the oil nationalization act under which it was created was actually signed May 1, 1951.

In the decade since then, Iran has weathered a great upheaval in its oil operations. Its output plummeted from the Middle East's No. 1 spot in 1950 to almost nothing in 1952. Then it climbed again under the operating agreement Iran made in southern Iran with an International Consortium in October, 1954. Today, Iran's output of some 1.1-million b/d is nearly double its 635,000 b/d average in 1950.

NIOC itself has developed during the decade into a full-fledged oil company operating within Iran for its own account.

It has taken over marketing and distribution of products in the entire country. It has built a pipeline, and is expanding its network, to carry products from Abadan to central and northern areas.

It is also producing and refining on a small scale in western Iran.

Further, NIOC has been pursuing an active exploratory program of its own in central and northern Iran, with two discoveries of oil and gas so far for which it has high hopes.

In addition, it is gradually taking over all social service and welfare functions performed by the Consortium and thereby will ultimately add 15,000 employees to its organization.

NIOC also has a direct stake in potential oil export operations now as a 50% partner in two joint-venture pacts made in 1957-58 with Italy's ENI group and with Pan American International.

ENI has just shipped out a cargo of crude produced in testing its initial offshore wildcat, while Pan American continues testing its first two wildcats, also offshore.

What's New / AROUND THE WORLD

Mobil Realigns Colombia Marketing

COLOMBIA—An expansion-minded Colombian company, in which Mobil has an 85% interest, will absorb the marketing personnel of Mobil's wholly owned Colombian subsidiary.

Codi, in which Mobil first purchased an interest in 1958, is now engaged in a service-station building and modernization program that will cost $1.5-million this year. With 300 outlets, Codi now holds 20% of the white products market. It will sell Codi branded gasoline and Mobil lubricants.

•

BRAZIL—Domestic oil prices are expected to double following government action last week in doubling the special foreign exchange rate for imports of oil and some other commodities.

There will be no change in dollar prices, but refiners and distributors will have to pay 200 cruzeiros, instead of 100, for each dollar's worth of imported oil.

•

TURKEY—Mobil, having abandoned one wildcat in the area of its Bulgurdag discovery, is ready to spud a second not far away. The firm abandoned the No. 1 Dutsuyu about 7 mi. southwest of Bulgurdag and moved its rig to the No. 1 Kocadere location, 6.5 mi. west of Bulgurdag.

•

VENEZUELA — Lake Maracaibo's first tender-assisted mobile drilling platform has been put into service for Mene Grand by Loffland Brothers Co. Mobile platforms have never been tried there before because of the lake's soft mud base. The unit now in use—built by R. G. LeTourneau, Inc., and towed to Venezuela—has three giant self-elevating legs, with large tanks filled with ballast water forming the bottom of each leg.

•

SYRIA—The Ministry of Industry will shortly call for tenders to develop and produce 40,000 b/d of crude at the Karatchok field, Syria's first. It was discovered in the northeast by the Menhall-Atlantic Refining group before its rights were canceled, and now has seven productive wells out of nine completed to date.

Tender specifications are being drawn up for additional drilling, commercial production, and construction of 80,000 tons of tankage. The government, meanwhile, plans to set up a $39.6-million oil company, with some private capital participation, to take over the field.

•

IRAN—The International Consortium's initial wildcat at the eastern end of its operating area has been abandoned at 14,895 ft. Testing of the No. 1 Suru showed no indication of oil in commercial quantities, National Iranian Oil Co. reports. The Consortium is now moving the rig to Sheikh Shuaib Island, about 100 mi. from the mainland town of Lingeh, where it plans to drill the No. 1 Lavan wildcat.

•

USSR—The first, and apparently promising, offshore discovery on the opposite shore of the Caspian from the Baku oil area will be probed further. Tass, official Soviet news agency, says five more wells will be drilled this year from a trestle linking the Cheleken peninsula with the wildcat discovery, ⅓ mi. offshore.

•

SAUDI ARABIA—Crude output in February topped 1½-million b/d for the first time, climbing more than 110,000 b/d for a third successive record. The average was 1,547,187 b/d, compared with 1,245,800 b/d in February, 1960. Crude runs to the Ras Tanura refinery were also at a record high of 257,878 b/d.

•

IRAN—Italy's ENI-Agip group has shipped its first Persian Gulf crude to Italy: a cargo of 18,000 tons produced in tests of the No. 1 offshore wildcat drilled for its joint account with National Iranian Oil Co. The well is still being tested, NIOC reports, while the second—drilled from the same fixed platform—has a fishing job at 7,047 ft. ENI's inland wildcat at Sequta, in the Zagros Mountains, is being sidetracked at 7,815 ft.

•

SICILY—Lion Oil Co. division of Monsanto Chemical Co. is giving up its stake in a joint exploration venture, in western Sicily, with the Italian Edison group. Its interest reportedly may be picked up by two French government-controlled companies that already have some exploration stakes there.

Venezuela Maps 'Oil Diplomacy'

CARACAS—Venezuela is overhauling its foreign service to shape it into an instrument of "oil diplomacy."

The reorganization reflects the country's new role in what Foreign Minister Marcos Falcon Briceno calls a "petroleum alliance" with other oil producing countries—its Middle East associates in the Organization of Petroleum Exporting Countries.

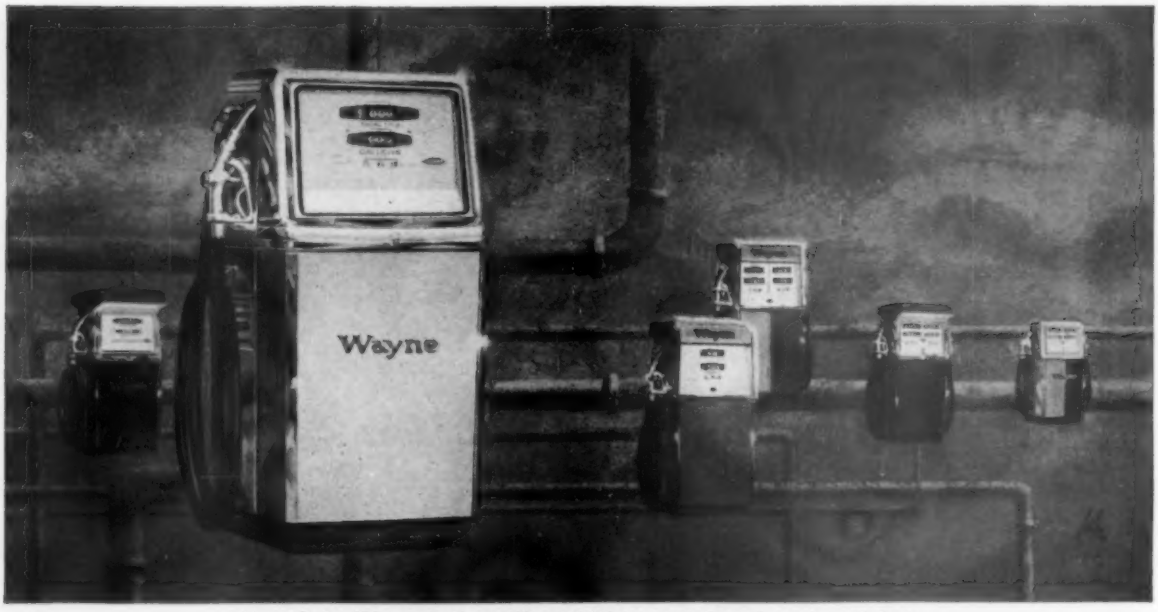
As one step in the overhaul, Venezuela will set up diplomatic missions throughout the Middle East.

The announcement, made by President Rómulo Betancourt, gave neither the rank nor the location of the new missions.

It is expected, however, that embassies or legations will be set up at least in Iraq, Iran, and Saudi Arabia. At present, Venezuelan relations in the Middle East are handled through embassies in Cairo and Ankara.

In another step, the Foreign Ministry has appointed a former assistant public relations chief of Creole Petroleum as its Director General, a new post that will absorb the Ministry's former foreign information and protocol services.

He is Dr. Francisco Alvarez Chacin, who quit his positions with Creole and as an alternate Director of the Venezuelan Oil Industry Chamber last fall amid local press speculation that he disagreed with the oil industry's attitude on official oil policy.



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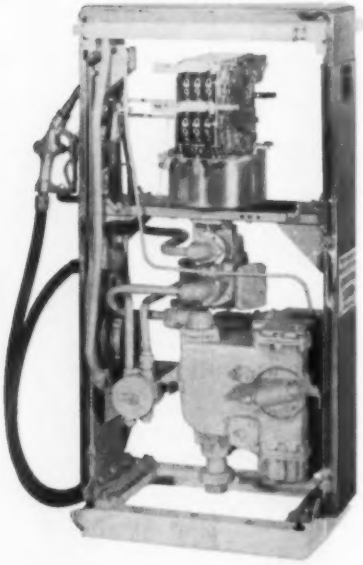

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What's Behind FTC's Ruling on TBA?

Ostensibly, the Federal Trade Commission wants to promote competition. But by nullifying TBA commission contracts, it may be decreasing it, oil legal experts contend.

Last week's rulings by the Federal Trade Commission against Atlantic Refining Co. and Shell Oil Co. raise more questions than they answer.

In these rulings, FTC outlawed overriding TBA commission plans. Through such plans, oil companies open their service stations to selected tire companies and derive a commission (between 7.5% and 10%) from the products that the tire companies sell to their dealers.

In last week's decisions, Atlantic was cited along with Goodyear Tire & Rubber Co., while Shell was paired with Firestone Tire & Rubber Co.

All four companies plan to appeal the decision.

A third case, which was remanded to an examiner for further data, paired Texaco Inc. with B. F. Goodrich Co.

The position that FTC has taken is one that a Congressional committee refused to recognize in December.

It's a thesis persistently put forth by Rep. James Roosevelt (D., Calif.). Roosevelt has tried to show that oil companies use the threat of lease cancellation to force dealers to accept a certain line of TBA items.

Roosevelt's hearings on this subject, however, have been so inconclusive that even the House Commerce Committee has failed to find anything in them on which legislation can be based.

Oil marketers were not surprised when, a few days after the FTC decisions were released, Roosevelt rose in the House of Representatives to hail them as landmarks in TBA issues.

Roosevelt got what he wanted. He can now back away from his divorcement crusade, oil men say, despite the "slapping down" he had taken from the House Commerce Committee.

What seems to have happened is something that Donald C. O'Hara, assistant general counsel for the National Petroleum Assn., had warned against only six months ago (PW—Sep.30'60,p44).

O'Hara had indicated that, despite the lack of success Roosevelt may have in Congress, his bills may indeed become law through the action of FTC.

This would be just another example, he said, in which activity in a Congressional committee spurs activity in the administrative branch of the government.

By outlawing commission plans, FTC automatically stresses its acceptance of purchase-and-resale TBA plans. This puzzles many oil men.

The commission's fundamental justification for its move is that by prohibiting commission plans it will pave the way for increased competition among tire companies.

It argued that, under commission plans, tire companies divide up an oil company's service stations and thereby "foreclose" this market to other tire companies and even reduce competition among themselves.

Some oil lawyers reason that commission TBA sales provide far more opportunity for other tire companies than purchase-and-resale plans do.

They argue that an oil company that buys tires for resale to its dealers has a greater financial interest in promoting a particular brand than commission-plan companies do.

In fact, one lawyer said last week, "I'd have thought that FTC would have attacked the purchase-and-resale plans first."

One explanation of the FTC move is that the agency is rankled by the lack of oil-company effort involved in commission plans.

All the oil company has to do under these plans, FTC said last week, is to tell a tire company where its new stations are, and then sit back and reap the commissions. The tire company does all the financing, shipping, warehousing, and selling.

But oil men say that when the oil company itself assumes all these responsibilities, it doesn't follow that competition is enhanced.

Another question oilmen are asking: Why does FTC believe it will reduce oil company influence over dealers by prohibiting commission contracts?

In 1959, hearing examiner Earl J. Kolb discovered nothing inherently wrong with the commission plans.

But FTC effectively reversed this opinion. It found, as Kolb had found, that coercion between oil companies and dealers does exist. But instead of ordering the oil companies to desist from exercising coercion, FTC Chairman Earl Kintner explained that he regarded the coercion merely as a symptom of the fundamental restrains inherent in the commission system itself. He therefore declared TBA commission contracts to be illegal.

But how can the contracts be at fault, oil executives demand? If an oil company has power over its dealers, that power will not be diminished through cancellation of commission contracts.

If FTC really wants to face up to the question of coercion, oil men say, it will have to analyze more thoroughly the real basis for the oil company's power—the dealer lease.

What will the courts do? For a clue to this answer, some industry men are looking at a recent case involving Sinclair Refining Co. and a dealer in Maryland.

In this case, Sinclair purchased TBA products from Goodyear and sold them to Kriete Osborn, a Sinclair dealer in Reisterstown, Md. No commission plan was involved here,

Who's Affected?

Besides Atlantic Refining Co., Shell Oil Co., and Texaco Inc., there are several oil marketers that use the commission plan in selling TBA.

Here is a partial list of such companies, together with the tire companies with which they have completed commission contracts:

American Petrofina	Goodyear
Anderson-Prichard	Goodyear
California Oil	U.S. Rubber, General
Continental	Firestone, Goodrich
DX Sunray	Firestone, Goodyear
Lion Oil	Firestone
Ohio Oil	Goodrich
Skelly	Goodrich

Source: National Petroleum News, a McGraw-Hill publication.

but Goodyear did all the warehousing and distributing for Sinclair.

Appeals Judge Simon E. Sobeloff did not attack this arrangement directly, but he deplored the undeserved power it gave Sinclair.

Sinclair, he ruled, "is not even in the business of selling the tied [TBA] products, but [it] is employing [its] economic power in the gasoline industry to force [its] dealers to do business with a supplier in another industry under an arrangement that yields the defendant an extraneous revenue."

In strikingly similar language, FTC called commission contracts "a classic example of the use of economic power in one market to destroy competition in another market."

In anticipating the court test, one Shell executive told Petroleum Week last week that he is "reasonably optimistic."

In Shell's case, he said, only 11 dealers, of thousands, testified.

There isn't enough evidence, he said, to justify the finding that coercion is implied simply by the existence of commission contracts.

Oil men will have to wait for the court's opinion on this question. One industry guess has it that a decision can't be expected before 1963.

Shell-Mex Ready to Take Orders With Push Button Speed

Shell-Mex & BP Ltd., has turned over the job of receiving 6-million gal. of monthly product orders (from as many as 3,000 customers) to a single clerk.

At its storage plant in Royston, England, the clerk briskly records the kind of product desired, the quantity, the day of delivery, and the method of shipment.

And if this isn't enough, he's ready to jot down special instructions.

Within four seconds after he's completed taking an order (85% of which come in by telephone), the clerk can swiftly transfer the information to punched paper tape.

The clerk's "assistant" in this job is DORIS, an automatic recording and invoicing machine whose full name is Direct Order Recording & Invoicing System.

DORIS, which was designed for the oil company by International Telephone & Telegraph Corp., is composed primarily of standard machines and components.

But DORIS' nimble memory and bookkeeping skill are better than "standard."

The machine has stored in its memory the full address and full terms of trade for each of the 3,000 customers in its "file."

Furthermore, it can match up orders with a full description and price of the products desired.

And if it hasn't received enough information to complete an order, it winks a red light to remind the clerk of his oversight.

Once the error has been corrected, DORIS turns the order over to ITT teleprinters, which print out an invoice and sales ticket.

3,000 CUSTOMERS can be listed on the large panels, and their orders can be spelled out on the smaller panel. All the clerk has to do is press the right buttons.

At this point a routing clerk steps in to take the invoice and brief a delivery driver.

The clerk communicates with DORIS through a maze of push buttons (picture).

Each button represents a customer, or a product, or details about volume or shipment.

After the clerk has pressed the appropriate buttons, he pushes a final button that sets DORIS in motion.

At the end of the day, DORIS turns in a perforated tape on which it has summarized the entire day's shipments.

Shell-Mex is testing DORIS with an eye on the possibility of using the automatic order recorder at other storage plants.

What's New
IN MARKETING

A bright picture for oil-heat equipment manufacturers was painted last week at API's research conference. One optimistic view: An average of 495,000 burner installations will be needed every year through 1970.

This estimate was contributed by Vernon A. Bellman, API's marketing vice-president.

In exploring this market further, T. J. Scott, chairman of API's marketing development subcommittee, said that in the northern climates, where two-thirds of the nation lives, oil heat replacements will be 400,000 next year.

In contrast, gas replacements will rise to 400, up from 200 this year.

Scott said, however, that the two most advanced oil heat units available now cost about $150 more than comparable gas units.

As a result, Scott said, "it may be necessary to sell equipment at cost," to overcome this difference.

•

The National Fueloil Council, which was once sparsely represented in the Midwest, has added two more refiner members there, and a third in New Jersey.

The new members are Berry Refining Co., Chicago; Pure Oil Co., Palatine, Ill.; and Hess, Inc., Perth Amboy, N. J.

This pushes the total refiner membership in NFC to 19 (five of which are predominantly Midwest refiners).

Last year, the council contributed nearly $3-million to advertising and promotion programs in the Midwest and on the East Coast. These funds are provided by the refiners and the 74 local market organizations that are affiliated with NFC.

•

The expanding LP-gas demand in the Midwest has attracted Petrolane Gas Service, Inc. This West Coast marketer has just acquired Hausgas, Inc., and H. S. H., Inc., Washington, Mo.

These two companies sell $1.5-million worth of LP-gas a year to 8,000 customers in east central Missouri. They operate nine marketing plants.

Petrolane, with the acquisition of Hausgas and H. S. H., now serves 96,000 customers through 168 plants located in ten western states, Alaska, western Canada, and Missouri.

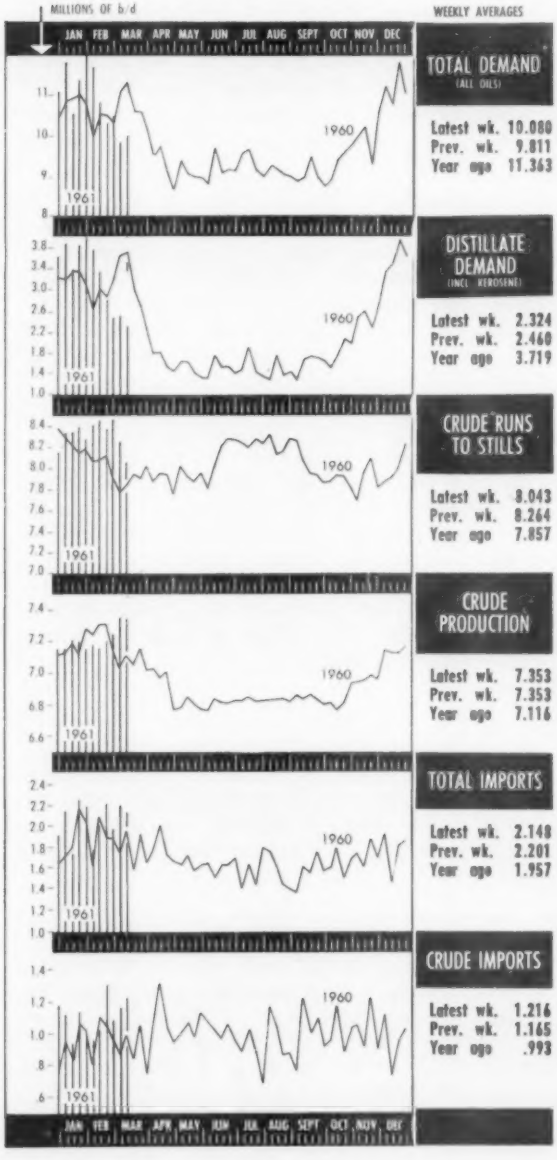
PETROLEUM WEEK'S Fingertip Figures

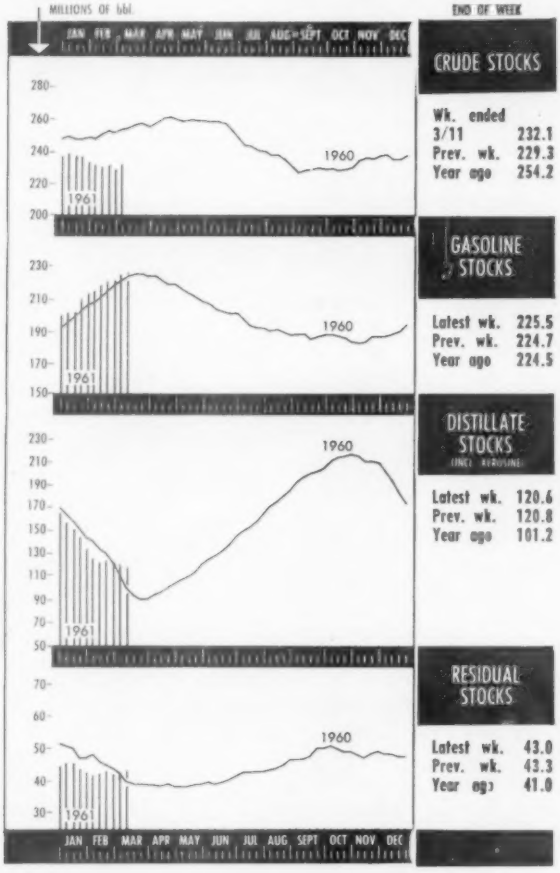
Crude runs to stills fell more than 200,000 b/d for the second consecutive week, bringing throughput to its lowest level since late December.

Runs last week averaged 8,043,000 b/d, down 221,000 b/d from the previous week, and a whopping 431,000 b/d from the all-time high reached during the first week in March. Crude throughput for the week ended Mar. 17, 1960, averaged 7,857,000 b/d.

But the picture is not as rosy as it looks at first glance. Over the latest four-week period, runs are averaging 4.7% higher than last year, while demand is off 7%. The milder weather during late February and so far in March weakened demand for heating oils. Distillate demand, averaging 2,530,000 b/d in the past four weeks, is running 851,000 b/d under the comparable period of 1960. Total demand is 765,000 b/d under 1960—and the drop would have been more severe except for a higher gasoline demand—for the latest four weeks it ran 182,000 b/d above 1960, at 3,896,000 b/d.

All figures below are for the week ended Mar. 17 unless otherwise noted.





Company Developments

Ethyl Corp. is opening a new gasoline testing laboratory at Long Beach, Calif., to serve West Coast refiners. The lab, which replaces an older unit in San Bernardino, is equipped to perform standard gasoline inspection tests, and also to rate diesel fuels for cetane number.

•

Dresser Electronics, SIE division, has satisfactorily field-tested the first of six seismic-refraction recording systems for use in nuclear detection.

The systems are being designed and built for the U.S. Geological Survey for use in part of the Vela Uniform Program, under the auspices of the Defense Dept.'s Advanced Research Projects Agency. This program involves improvements in seismological and other geophysical techniques for detecting underground nuclear tests and distinguishing them from earthquakes and other natural seismic disturbances.

•

National Marine Service plans to expand its service to shippers in the chemical industry with a large aluminum barge. The barge will be built by Ingalls Shipbuilding Corp. for Reynolds Metals Co., which will contract it to National.

The barge will be 100 ft. long, 50 ft. wide, and 11 ft. deep, and will weigh more than 200,000 lb. Its cargo tanks will hold 9,000 bbl.

•

BJ Service Inc., a division of Borg-Warner, is opening a district office and plant at Longview, Tex. The company has been serving the oil and gas industries since 1928, and features cementing, fracturing, and acidizing of wells. It has 67 stations throughout the nation and in several foreign countries.

•

Dresser Industries, Inc., feels the rate of incoming orders is "heartening." The company's backlog of unfilled orders climbed 15% during February to $51.2-million. H. N. Mallon, chairman, noted that the company had $45-million in unfilled orders at the end of the first fiscal quarter on Jan. 31. During those three months, Dresser's backlog of orders increased 16% over the $38.7-million on the books at the beginning of the fiscal year.

•

Acquisitions

MWL Tool & Supply Co., Midland, Tex., now holds a 50% interest in Diamond Oil Well Drilling Co., also of Midland. Both operate in the Permian Basin. MWL bought its interest from American Research & Development Co., Boston. The remaining 50% interest in Dowdco is held by J. K. Smit & Sons, Murray Hill, N.J. The companies will continue to operate separately, although H. Ed Lindsey, Jr., president of MWL, will now serve as president and manager of both.

•

Bell Intercontinental Corp. has acquired operational control of Intex Oil Co., Bakersfield, Calif. Intex stockholders have approved Bell's offer to purchase 350,000 shares of Intex stock. By adding these to what it already holds, Bell will own more than 50% of the outstanding shares of Intex.

•

Overseas

ACF Industries, Inc., is further expanding its foreign operations—this time in France. The company has entered into a licensing agreement with Compagnie des Compteurs, of Paris, on behalf of its W-K-M division. The French company will make refinery fittings and return bends with W-K-M designs and technical and engineering assistance.

•

Work got under way last week on Columbian Carbon Co.'s $1.6-million carbon black plant at St. Martino di Tricate, Italy. The Po Valley plant will be run by the company's Italian subsidiary, Columbian Continental Europa SpA, with headquarters in Milan.

•

Gates Rubber Co. will take its first step overseas with a new manufacturing plant at Erembodegem, Belgium. It will produce all lines of industrial hose, V-belts, and molded rubber goods. The Denver company is celebrating its 50th anniversary this year.

REMICK McDOWELL is the new chairman and chief executive officer of Peoples Gas Light & Coke Co., Chicago, and **Leslie A. Brandt,** succeeds him as president. In his new position, McDowell succeeds **Eskil I. Bjork,** who is retiring. Brandt, the new president, has been a vice-president of the company since 1952, and comptroller since 1957. He will also serve as president of Chicago District Pipeline Co., a subsidiary.

R. McDowell

J. B. Henderson

JAMES B. HENDERSON, vice-president of Transcontinental Gas Pipe Line Corp., Houston, has also been elected a director of the company. He has been Transco's vice-president and general counsel for the past 12 years. At the same time, **Donald Russell,** a former president of the University of South Carolina, was also elected a Transco director. Russell is currently an attorney in private practice.

L. F. McCOLLUM, president of Continental Oil Co., Houston, has been elected to the board of trustees of the California Institute of Technology, Pasadena. McCollum holds directorships in six Continental subsidiaries and affiliates, and is a director of Morgan Guaranty Trust Co., New York, and Chrysler Corp.

RALPH JAMES moves up to senior staff engineer in the technical division at Humble Oil & Refining Co.'s Baytown (Tex.) refinery. James, a member of the applied math and computing section, is engaged in developing and applying advanced engineering concepts to improving mechanical design and performance of processing equipment, and serves as a consultant to other engineers on special problems in that area.

KENNETH F. KELLER is the new exploration manager of Mobil Oil Co.'s Midland division. He succeeds **O. H. Blexrud,** who has been named president of Mobil Oil of Canada, Ltd., Calgary. Keller, who joined the company in 1946 as a geologist, was promoted to district geologist at Shreveport, La., in 1951. In 1956 he was transferred to Houston as district geologist, and remained in that position until 1960, when he was promoted to district superintendent of the Houston district, Houston division.

WILLIAM H. DAVIDSON, JR., has been named to the new position of general attorney for Transcontinental Gas Pipe Line Corp., Houston. For 11 years, he has been Transco's chief trial counsel. Davidson will continue as vice-president and general counsel of Transcos LPG subsidiary.

GEORGE W. ROTH has been appointed director, product procurement, refinery sales, for Gulf Oil Corp., in New York. He succeeds the late **N. C. (Cal) Loomis.**

J. B. CECIL has been promoted to manager of Continental Oil Co.'s coordinating and planning department, with offices in Houston. He was formerly assistant controller for Conoco at Ponca City, Okla. **L. W. Clayton,** formerly director of financial accounting at Ponca City, succeeds Cecil, and **W. R. Reed,** formerly assistant to Conoco's controller at Houston, succeeds Clayton at Ponca City. Cecil, who joined Conoco at Ponca City in 1951, served as a staff accountant and assistant director of manufacturing accounting there before moving to Houston in 1956 as assistant to the controller. He has been assistant controller at Ponca City since 1957.

J. B. Cecil

P. H. Weyrauch

PAUL H. WEYRAUCH moves up to treasury coordinator for Gulf Oil Corp., with offices in Houston, He has been Gulf's manager of domestic banking, in Pittsburgh, since 1959. Weyrauch will be on the staff of **K. E. Rotegard,** manager of the services department in Houston, and will be responsible for the banking, cash handling, and financing activities of the domestic operating departments. Over-all policies of Gulf's treasury matters will continue to be directed by **H. R. Moorhead,** treasurer in Pittsburgh.

MAX R. LENTS, vice-president and general manager of Reef Corp., Houston, was named president of the Natural Gasoline Assn. of America, at its annual meeting last week. Newly elected vice-presidents of NGAA are: **G. W. McCullough,** vice-president, Phillips Petroleum Co.; **K. G. Pearce,** vice-president, Tenneco Oil Co.; **Albert Taylor,** executive assistant, Amerada Petroleum Corp., and **Dr. C. T. Wells, Jr.,** president, Goliad Corp. NGAA's Hanlon award this year was given to **John C. Diehl,** retired chairman of American Meter Co. The annual award is given for outstanding service to the natural gasoline industry.

GEORGE W. JANDACEK is the new general manager of Suntide Refining Co.'s Corpus Christi (Tex.) plant. He was formerly assistant to the manager of DX Sunray's refinery in Duncan, Okla. **J. L. Laird** will remain plant manager at Suntide. Other Suntide changes include: **J. A. Hutsell,** plant superintendent, will become manager of operations; **J. H. Miller,** manager of process and control engineering, will become manager of technical services; **L. W. Plummer,** chief mechanical engineer, will become manager of maintenance and plant engineering.

LORNE S. WADDELL has been named to the newly created position of manager of communications for the American Gas Assn., with offices in New York. **Edward J. Reardon,** formerly city editor of the Evening News, Perth Amboy, N. J., succeeds Waddell as manager of AGA's press relations. Waddell came to AGA in 1958 from Tom Compere & Associates, a New York public relations firm.

W. L. BUTTE will become a deputy regional coordinator for Standard Oil Co. (N.J.), and its London Middle East representative, in May. He succeeds **Paul J. Anderson,** who has been nominated for election to Jersey Standard's board of directors. Butte's appointment is part of a program designed to bring London personnel handling Middle East matters into the organization of the regional coordinator, Middle East. Butte will be in charge of the London group. He has been deputy London Middle East representative since 1958, and before that was director of Creole Petroleum Corp., Jersey's Venezuelan affiliate. He was the first chairman of Jersey Standard's Middle East committee. At the same time, **V. C. Georgescu,** associate London Middle East representative, will become deputy London Middle East representative, and **C. M. Boyer,** who has been a member of the New York staff of the Middle East coordinator, will become assistant London Middle East representative.

W. L. Butte

C. C. Dunn

CHARLES C. DUNN has been elected managing director of Regent Oil Co., Ltd., an affiliate of Texaco Inc. in the United Kingdom. Dunn, who has been vice-president in charge of sales for Texaco Canada, Ltd., since 1951, and a director since 1959, will move from Montreal to London.

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S. L. BARBER has been elected vice-president of Walworth Co., New York, and president of its pipe-fabricating subsidiary, Southwest Fabricating & Welding Co., Houston. **A. B. Judd**, who has been president of the subsidiary, will become chairman of its board. Barber was formerly executive vice-president of Taylor Forge & Pipe Works, and was most recently president of Uni-Flex Mfg. & Engineering, Inc., Los Angeles.

S. L. Barber

J. S. Downs

J. S. DOWNS, who heads the W-K-M division of ACF Industries, Inc., in Houston, has been elected an ACF vice-president. He will continue to head the division as general manager. His new title "recognizes more appropriately his level of responsibility in the corporate organization." At the same time, the titles of division president and division vice-president have been eliminated in all the company's operating divisions; division vice-presidents will now hold the title of director of their respective activities. W-K-M executives with new titles are: **B. J. Gross**, director of marketing; **H. C. Tooley**, director of manufacturing; and **R. O. Wynn**, director of quality control and customer service.

GEORGE E. CONNER, president of Milwhite Mud Sales Co., Houston, has been elected a director of Mississippi River Fuel Corp., St. Louis. Milwhite Mud is a subsidiary of Mississippi River, which owns and operates a natural gas transmission pipeline system serving the greater St. Louis area.

DENNIS M. FRAUENBERGER has joined Southwest Industries, Inc., Houston, as a sales engineer. He will handle sales and service in the Houston area for the company's line of precision-engineered equipment for the petroleum and chemical industries. Frauenberger was formerly associated with Tuboscope Co., serving in field inspection, quality control, and general sales.

EDWARD A. WILLIAMS has been elected vice-president, operations control, for Collins Radio Co., Cedar Rapids, Iowa, and **ROBERT P. DUTTON** has been elected vice-president, government representation. Williams was formerly controller of Collins' Cedar Rapids division, and Dutton was manager of the company's office in Washington, D.C. Dutton will continue to be located in that city as Collins management representative. In addition, all government field offices of Collins' operating divisions and subsidiaries will report to Dutton.

WALTER H. HELMERICH, III, and **GUY R. MABEE** are new directors of the First National Bank & Trust Co. of Tulsa. Helmerich is president of Helmerich & Payne, Inc., Tulsa, and Mabee is an independent oil man in West Texas.

WILLIAM MISKIMINS moves up to manager, store products, for the Oil Well Supply Division of United States Steel Corp., with offices at the division's headquarters in Dallas, and **Robert H. Smith** has been named director, product service, for the division there. Miskimins has been area manager of Oilwell's central midwest area, at Dallas, since 1954. He joined the division as a salesman in 1917 at Houston. Smith joined U.S. Steel in 1949, and transferred to Oilwell in 1953 as an analyst in the production and planning department. He was most recently assistant to Oilwell's vice-president, merchandise.

W. Miskimins

J. Mershon

JACK MERSHON has joined C-B/Southern, a division of Cooper-Bessemer Corp., as sales manager of its Mid-Continent district, with offices in Tulsa. His area includes the Mountain states, the West Central states, and Western Canada. Mershon was formerly president of Southwest Industries of Texas, and vice-president of Southwest Industries, Inc., in Houston. C-B/Southern builds compressor plants for gas gathering, gas lift, gas injection, and gas storage applications.

FREDERICK L. SCHUSTER has been named to the board of Foster Wheeler Corp. He is board chairman of both Automatic Canteen Co. of America and Cavitron Corp.

ROBERT A. MOODY, budget director of Universal Oil Products Co., in Des Plaines, Ill., since 1957, has also been elected assistant treasurer of the company. Before joining UOP in 1956, Moody was associated with Humble Oil & Refining Co.

C. AYEARST and **G. H. MERCIER** are new supervisors, commercial-industrial development, for the Royal Bank of Canada, in Montreal. Ayearst was formerly manager, and Mercier associate manager, of commercial-industrial development.

J. M. BUGBEE, JR., is the new manager of the Tri-State area for the Baroid Division, National Lead Co., with offices in Shreveport, La. He will be responsible for Baroid activities in East Texas, northern Louisiana, and Mississippi. Bugbee, with Baroid since 1947, was most recently assistant area manager of the lower Gulf Coast area.

J. M. Bugbee, Jr.

T. I. Stacy

THOMAS I. STACY is manager of Rockwell Mfg. Co.'s newly created valve actuator products department, which headquarters in Pittsburgh. He will supervise the sales and administrative activities of this department, and coordinate the work of central engineering, and other plant engineering departments on this type of equipment. Stacy, who joined Rockwell in 1938, became Houston district sales manager in 1954, and in 1957 was promoted to assistant product manager, pipeline and gas utilities valve sales, his most recent position.

MYRON A. ANGIER has been named general sales manager for the Remington Rand Univac Division of Sperry Rand Corp., New York. Angier joined the company in 1946 as a trainee for tabulating machine sales. In 1952 he was promoted to assistant branch manager of the Univac division in New York. He has been southern regional sales manager for the division, in Atlanta, Ga., since 1959.

BARRY THOMPSON has been appointed western division manager in Venezuela for Ken South America, affiliate of Ken Corp. He succeeds **A. F. Walden,** who will become superintendent of the parent company's Ventura (Calif.) district. Thompson has been a service engineer in California for the parent company, and in 1959 transferred to Venezuela as a service engineer for Ken South America.

GEORGE R. GRAY, Baroid Division, National Lead Co., Houston, and **LLOYD A. LITTLE,** Lufkin Foundry & Machine Co., Lufkin, Tex., were awarded Citations for Service at the recent meeting of the American Petroleum Institute's southern district, at Shreveport, La. Gray's award is in recognition of outstanding service since 1951 to oilwell drilling fluids studies. The award to Little recognizes his service in API's oilwell production equipment standardization program.

JAMES A. LIONTAS moves up to manager of field engineering for the analytical and control division, Consolidated Electrodynamics Corp., Pasadena, Calif. He will be responsible for sales of the division's chemical analytical instruments throughout the country. Liontas joined CEC, a subsidiary of Bell & Howell Co., in 1959.

ERIC H. RASK has been appointed manager of product engineering for Veeder-Root, Inc., Hartford, Conn. He was most recently manager of shaver research and development for Sunbeam Corp. in Chicago.

JOHN M. SCANDALIOS has been appointed manager of the Detroit offices of Minneapolis-Honeywell Regulator Co's data processing division. Scandalios, who joined Honeywell in 1959 as an associated methods analyst, was most recently an account representative in the company's Detroit office.

WILLIAM J. BROWN has been appointed district manager for OPW Corp.s Rocky Mountain area, with offices in Denver. He will be responsible for OPW's activities in Montana, Wyoming, Utah, Colorado, and parts of New Mexico, and Idaho. Brown, who joined OPW last year, has also been associated with Shell Oil Co., and Ford Motor Co.

CLYDE RICKARD has been named pipeline coatings sales representative in St. Louis for the protective coatings division of Pittsburgh Chemical Co. His territory covers Missouri, Illinois, Iowa, North and South Dakota, Minnesota, and Wisconsin. Rickard was formerly full-line product sales representative for the protective coatings division in Missouri and part of Illinois.

RICHARD F. COOK, editor of Ethyl News, and Ethyl Corp. itself, have been awarded George Washington Honor Medals in the company publications category, given by the Freedoms Foundation. This is the second consecutive year that Ethyl's bimonthly external magazine won in this category. The publication was cited for "outstanding achievement in bringing about a better understanding of the American way of life."

THE 1961 OFFICERS OF THE LOS ANGELES NOMADS, shown at their recent inaugural ball, are (front row, l. to r.): **Tom R. Ashe,** Globe Oil Tools Co., regent; **Taylor Bannerman,** Technical Oil Tool Corp., regent; **Charles M. King,** Baker Oil Tools, Inc., president; **Robert P. Gaylord,** Wagner-Morehouse, Inc., master of ceremonies; **Jack S. Smith,** Byron Jackson Tools, Inc., vice-president; and **Williard F. Goertz,** Monarch Engineering Corp., deputy sergeant-at-arms; and (back row) **Henry W. Pullman,** Baker Oil Tools, Inc., senior regent; **John Cochran,** Driltrol, assistant treasurer; **Louis Q. Webber,** Martin-Decker Corp., treasurer; **Ray Elner,** Kobe, Inc., secretary and **Lee J. Laird,** Ladish Pacific Division, sergeant-at-arms.

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We Are Running Out of Incentive

THE PETROLEUM INDUSTRY'S STRONGEST CASE yet for continuation of percentage depletion is shown in the story that starts on page 11. It covers the annual reports of the Joint Committee on Reserves of the American Petroleum Institute and the American Gas Assn., and the Committee on Statistics of Exploratory Drilling of the American Assn. of Petroleum Geologists.

The results found by these exhaustive studies don't make very good reading. In one sentence: 1960 was the poorest, exploration-wise, in the postwar period.

Fewer exploratory tests were drilled in the U.S. than in any year since 1950. The ratio of success of all exploratory tests was the worst since 1948. The volume of new liquid hydrocarbons discovered was the smallest of the postwar period. All told, the oil-finding rate—the number of barrels of liquids found in new fields or new pools per foot drilled—dropped to a postwar low. The finding rate of 11.4 bbl. per ft. last year was one-fifth of the 1949 finding rate.

THE RESULTS FOR ONE YEAR do not set a pattern. During the postwar period, the oil-finding rate has had its ups and downs, but it is significant to note that the general trend since the mid-50s has been down. Perhaps stronger support for percentage depletion can be found in the AAPG committee's 11-year study (1944-54) of new-field wildcats, based on fields with six years of productive history.

The conclusion reached is that only 2% of all new-field wildcats find reserves that are profitable—that is, those tests find pools with ultimate reserves of 1-million bbl. or more.

The results of both studies should be analyzed and used by all oil men interested in maintaining a virile domestic industry. The facts should certainly be called to the attention of congressmen and the various government agencies now so concerned with the so-called national fuels policy.

WE ARE NOT RUNNING OUT OF OIL. The findings of the AAPG study show that of all rank wildcats drilled in the past 17 years, the ratio of success to failure (tests that showed some oil or gas) has been almost constant—11.08%.

But producers are beginning to run out of incentive. The 11.2% decline in total exploratory tests last year reflects just that. Any reduction in the present 27.5% depletion provision in face of the tight cost-price squeeze on producers would just about kill what incentive remains.

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So—if you are considering new pumps or faced with repairing pumps now in service, don't overlook "Oilwell's" application know-how, accessibility of 51 strategic repair locations, and the versatility of our complete line of pumps. You are assured the right pump for your particular well.

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